SunStar

USER'S MANUAL

KM-2070P SERIES

Electronically Controlled
1-Needle ZigZag Lock
Stitch Machine
Electronic Control Part

1) FOR AT MOST USE WITH EASINESS, PLEASE CERTAINLY READ THIS MANUAL BEFORE STARTING USE.
2) KEEP THIS MANUAL IN SAFE PLACE FOR REFERENCE WHEN THE MACHINE BREAKS DOWN.

SunStar CO., LTD.

MEE-090929

1. Thank you for purchasing our product. Based on the rich expertise and experience accumulated in industrial sewing machine production, SUNSTAR will manufacture industrial sewing machines, which deliver more diverse functions, high performance, powerful operation, enhanced durability, and more sophisticated design to meet a number of user's needs.
2. Please read this user's manual thoroughly before using the machine. Make sure to properly use the machine to enjoy its full performance.
3. The specifications of the machine are subject to change, aimed to enhance product performance, without prior notice.
4. This product is designed, manufactured, and sold as an industrial sewing machine. It should not be used for other than industrial purpose.

SunStar CO., LTD.

Contents

1. Internal Structure of Control Box ---- 4

2. Connection of Power Voltage and Control Box Cable ---- 5

1) Power Voltage and Power Code Connection ---- 5
2) Cable Connection to Control Box ---- 6

3. Using Operation Panel and Sewing ---- 7

1) Operation Panel and key Functions ---- 7
2) Pattern Setting Method ---- 8
3) Sewing Method of Left/Right Scallop ---- 10
4) Sewing Method of Left/Right Blind ---- 11
5) Sewing Method of Left/Right L-Stitch ---- 12
6) ZigZag Width (Max. zigzag-width: 10mm) ---- 13
7) Sewing Speed ---- 14
8) Using Method of Start Condence ---- 15
9) Using Method of End Condense ---- 17
10) Setting of Base-Line ---- 19
11) Left/Right Stop Location of Needle ---- 21
12) Up/Down Stop of Needle ---- 23
13) Basic Concept for Operation of Operation Panel ---- 23
14) Reverse (mirror) Function ---- 24
15) Name Stitch ---- 26
16) Deciding Presser Foot Up/Down Location ---- 28
17) Thread Trimming and Wiper Function ---- 28
18) Auto Function ---- 28
19) Half Stitch Operation ---- 28
20) Using Reverse Feed Control Lever and Using Reverse Button(A Button) ---- 29
21) Rom Pattern (Use Pattern) Input Method ---- 30
22) Formatting ---- 30
23) Method of Setting the Starting Point ---- 31

4. Error Indications and Action Plan ---- 32

5. Others ---- 33

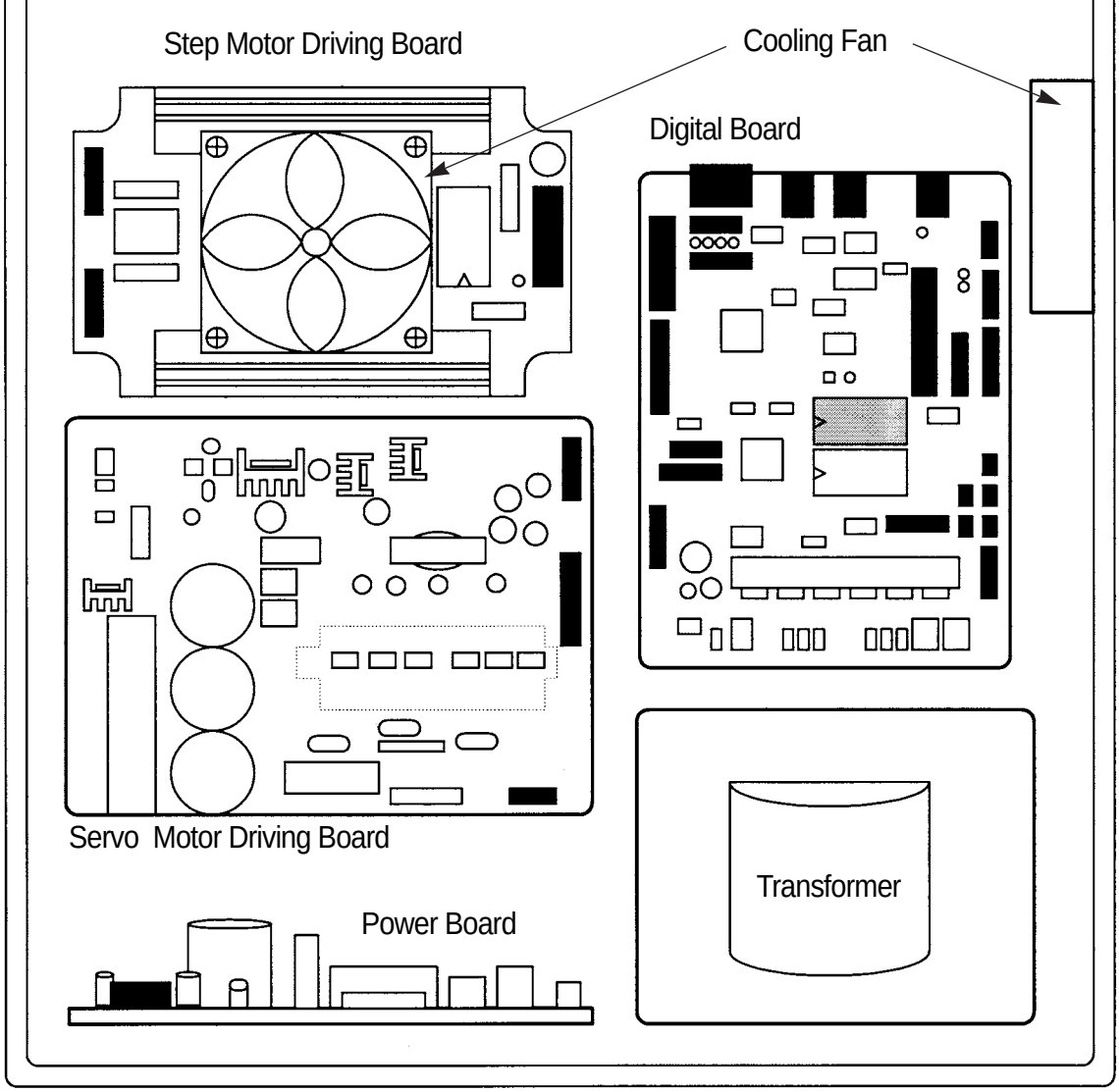
1) Initialization of Machine ---- 33
2) Intertia Tuning ---- 33
3) Hook Test Function ---- 33
4) Machine Test Function ---- 34
5) Parameter Changing Method and Classification ---- 37
6) Exchanging the Fuse ---- 40

6. Block Wiring Diagram ---- 41

1

Internal Structure of Control Box

[2070P CONTROL BOX]



2

Connection of Power Voltage and Control Box Cable

1) Power Voltage and Power Code Connection

(1) Voltage Specification

· Match the indication of voltage to specification of power code and connect the cable.

1. Must not use on condition that voltage specification is different.
2. In case of change the using voltage, refer to the article. [Power Voltage Changing Method]

· Single-phase connection(100V, 110V, 120V, 200V, 220V, 240V)

· Three-phase connection (200V, 220V, 240V, 380V, 440V)

(2) Power Voltage Changing Method

· In Voltage of 110V series, 220V series and 380～440V specification, you can change into the voltage as follows by just changing the location of power voltage switching connector

■ Voltage change of 100~220V specification
Trans former Model: KM-2070P-110

Input Voltage	Location of Power Voltage Switching Connector
95V~105V	JP3
106V~115V	JP4
116V~125V	JP5

■ Voltage change of 220V specification
Trans former Model: KM-2070P-220

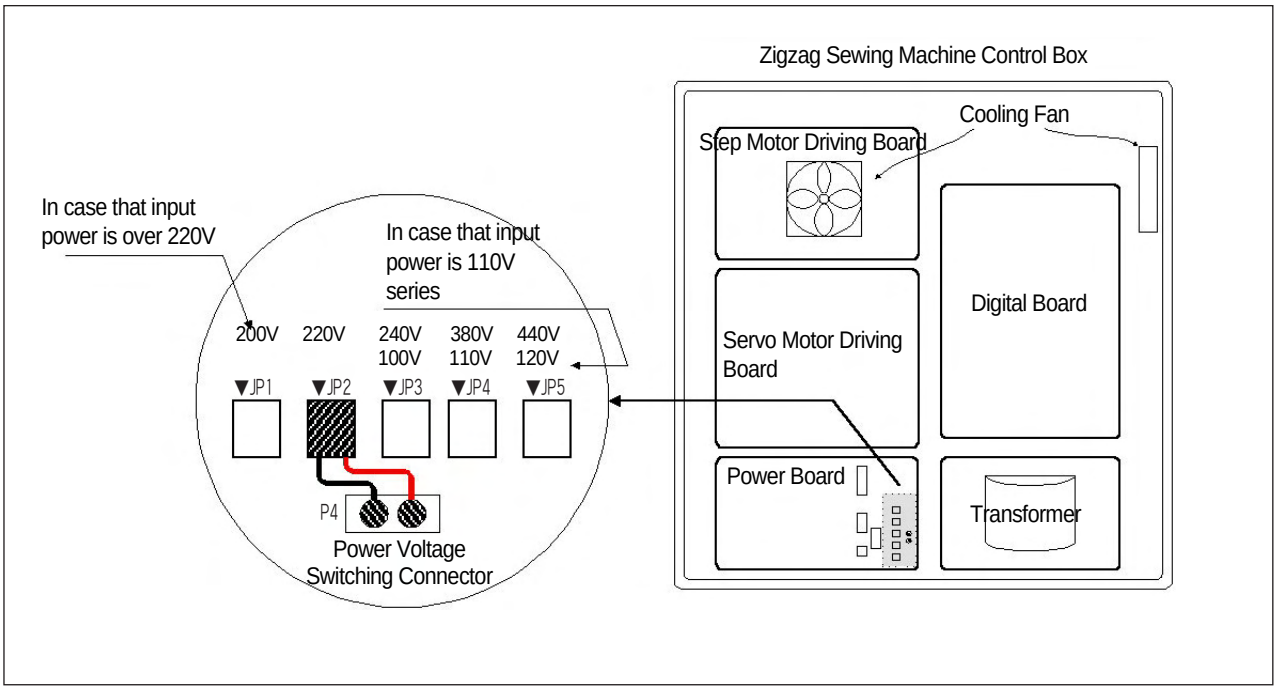
Input Voltage	Location of Power Voltage Switching Connector
190V~210V	JP1
211V~230V	JP2
231V~250V	JP3

■ Voltage change of 380~440V specification
Trans former Model: KM-2070P-440

Input Voltage	Location of Power Voltage Switching Connector
345V~415V	JP4
416V~480V	JP5

Danger

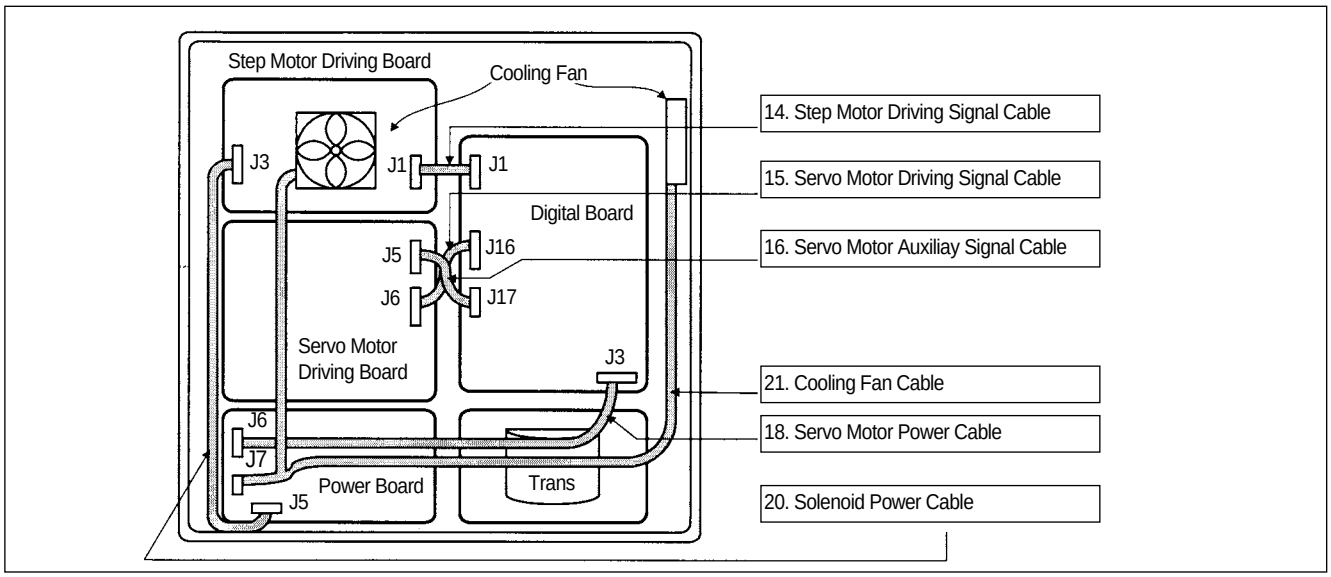
If power voltage switching connector is wrongfully set, control box can be damaged. In case that changes voltages between the phases 110V and 220V series and 380V～440V series transformer should replace. Please refer to Item 5 to 6 concerning fuse capacity in the power board and usage



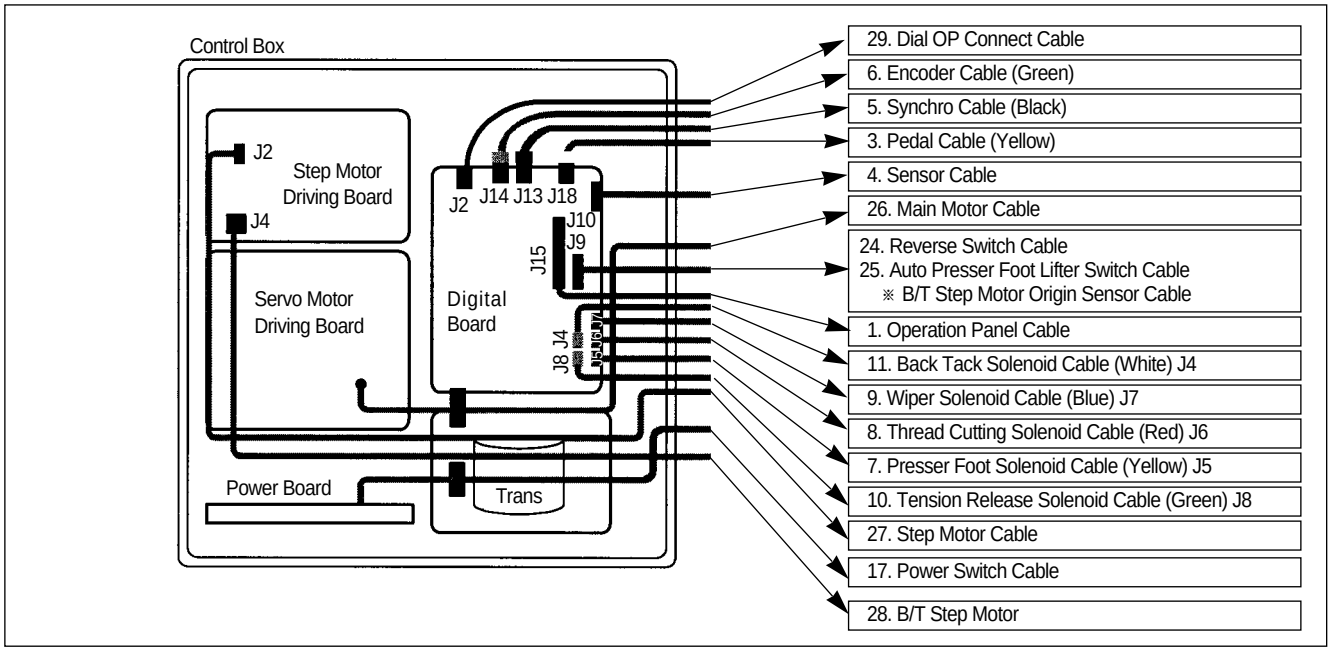
[Power Voltage Switching Connector Setting] [Fig. 1]

2) Cable Connection to Control Box

A. Internal Wiring of Control Box (Common in all types)



B. External Wiring of Control Box

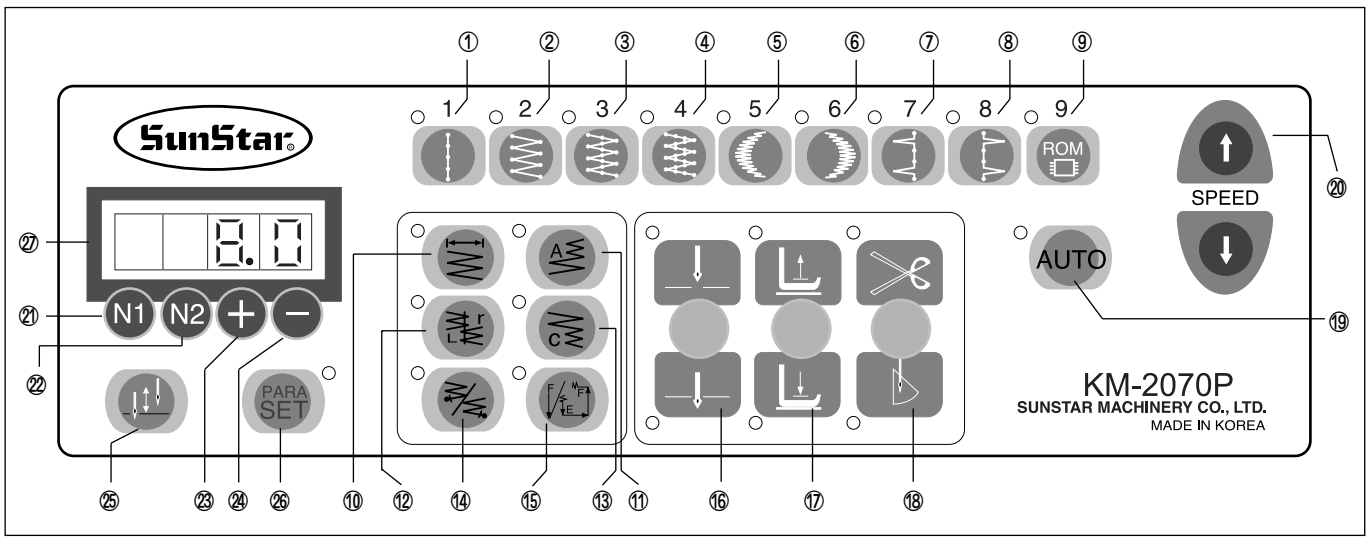


Note	See "Block Wiring Diagram" · Upper Figure is wiring diagram based on KM-2070P-7 model and the wiring in case that selected Knee-lifter switch (including presser foot solenoid) for option · As KM-2070P model are none-thread trimming type, it does not need to connect cable for thread trimming , wiper, tension release solenoid. · Switch cable consists of two; white and blue connector(Knee-lifter switch is option) White connector : Connect reverse button Blue connector : Connect Knee-lifter switch (connect presser foot solenoid cable as well) · In case of power cable connection, pay attention to fix to table that interference does not occur with belt.

3

Using Operation Panel and Sewing

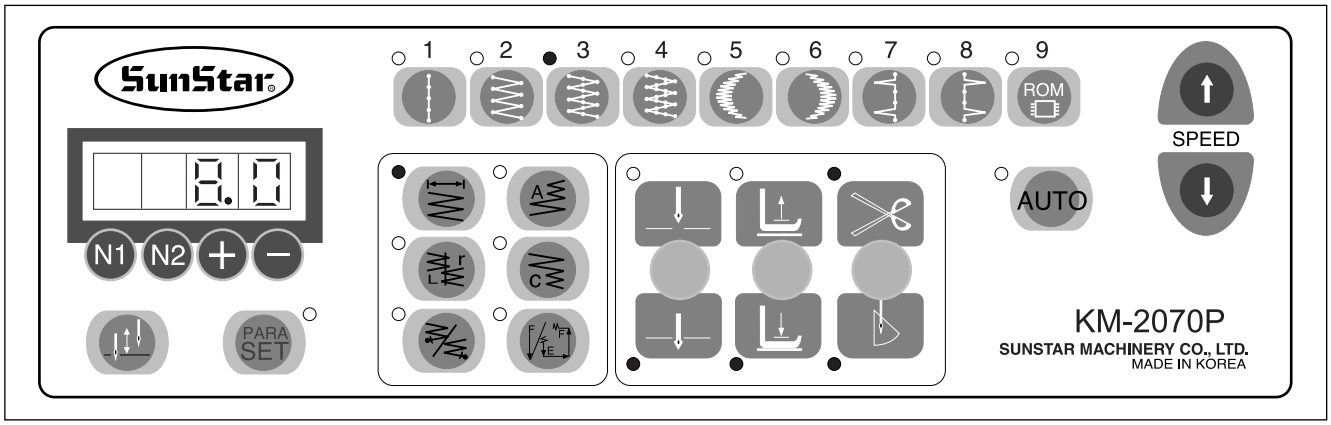
1) Operation Panel and Key Function



① Straight Line Pattern Key
② 2 point pattern key
③ 3 point pattern key
④ 4 point pattern key
⑤ Left -scallop pattern key
⑥ Right-scallop pattern key
⑦ Left-blind pattern key
⑧ Right-blind pattern key
⑨ ROM pattern (user pattern) key
⑩ ZigZag-width key
⑪ Start Condense key
⑫ Base line key
⑬ End condense key
⑭ Needle Left/Right Stop key
⑮ Name stitch key
⑯ Needle Up/Down stop key
⑰ Presser foot up/down key
⑱ Thread trimming/wiper key
⑲ Auto key
⑳ Speed key
㉑ N1 key
㉒ N2 key
㉓ + key
㉔ - key
㉕ Half-Stitch Key
㉖ PARA/SET key
㉗ Indication device
◯ Indication lamp

2) Pattern Setting Method

■ Operation Panel Indication Status



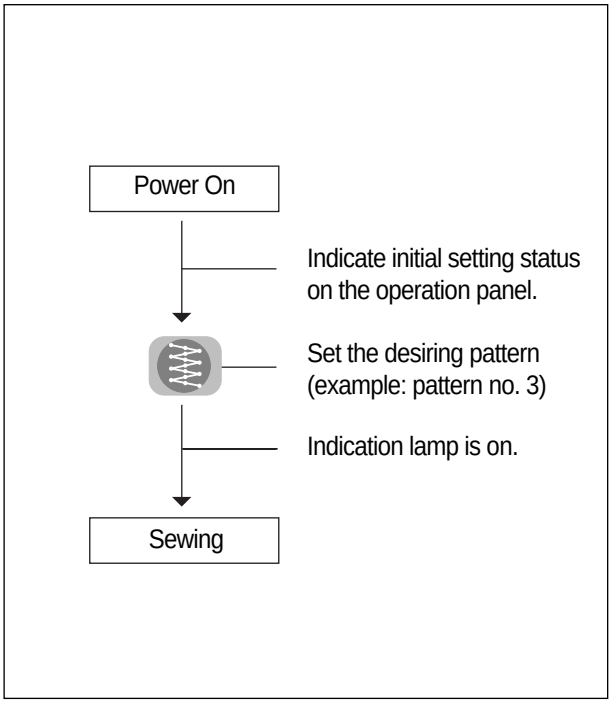
■ Operation Order

1. Turn on the power.

<Initial Setting Status of Operation Panel>

Indication Device (Unit: 0.1mm)	ZigZag-Width Indication (8mm)
Indication lamp of 2 point pattern	Turned On
Indication lamp of needle down stop	Turned On
Presser Foot Indication Lamp	Turned On
Thread Trimming Indication Lamp	Turned On
Wiper Indication Lamp	Turned On

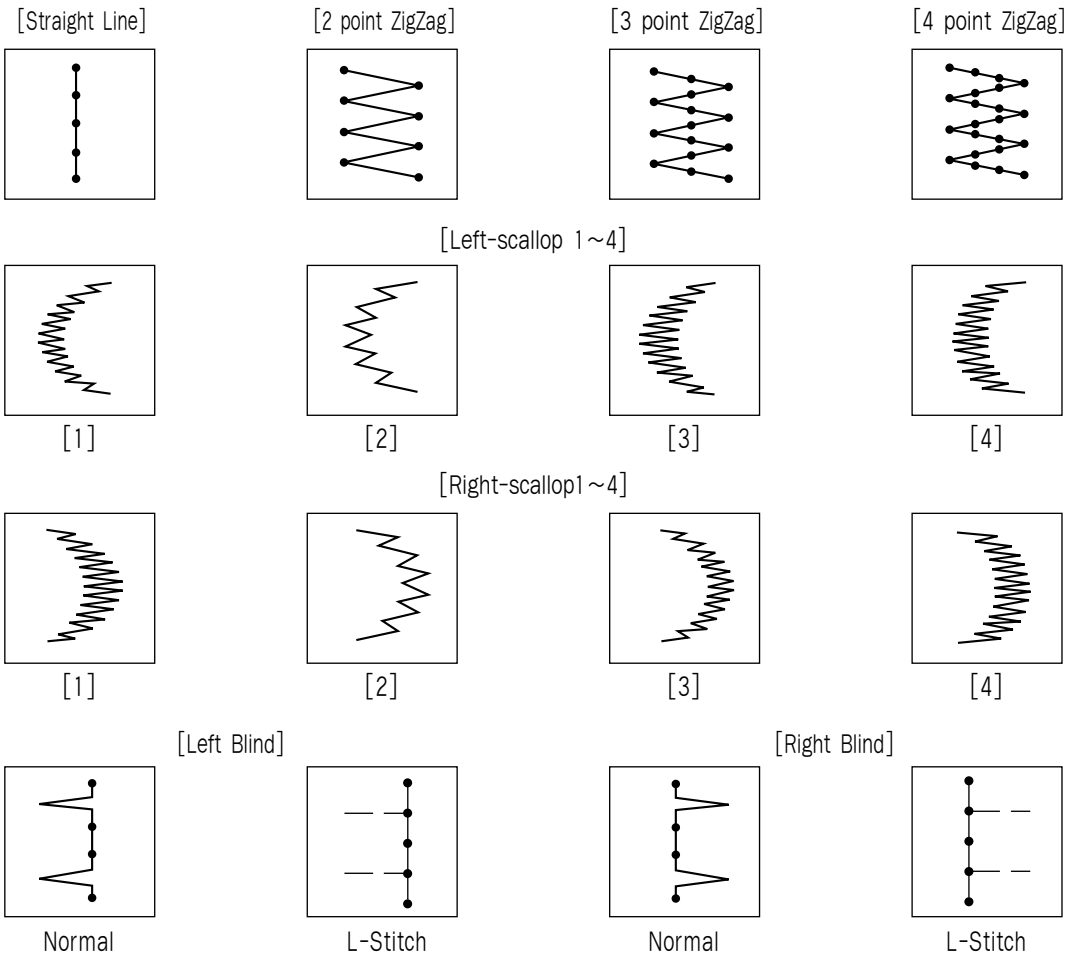
2. Pressing the key of the desired pattern, the lamp of selected pattern is on.
   - Example: selection of pattern number 3 (3 point zigzag pattern)
   - See 3) for selection of left, right scallop pattern
   - See 4) for left and right blind pattern
3. Then, start sewing by stepping on the pedal.
4. Execute thread trimming by stepping back the pedal after completion of sewing.
   (Thread trimming and wiper are options)


Power On
Indicate initial setting status on the operation panel.
Set the desiring pattern (example: pattern no. 3)
Indication lamp is on.
Sewing

[Note]
When the power turned on, if buzzer tone rings and □□UP is displayed on indication device, it means needle bar is not on the up stop location. Therefore, turn the pulley to the front by hand that the needle bar can be at up stop location. Then, indication device discappers□□UP and shows zigzag-width and you can start sewing.

■ Basic Pattern Number and Shape

Pattern No.	Pattern Name		Status of Indication Device
1	Straight Line Pattern		1 - □ □
2	2 point (standard) zigzag pattern		2 - □ □
3	3 point (2 step) zigzag pattern		3 - □ □
4	4 point (3 step) zigzag pattern		4 - □ □
5	Left Scallop pattern	1(24 Stitches)	5 - 1 □
		2(12 Stitches)	5 - 2 □
		3(24 Stitches)	5 - 3 □
		4(24 Stitches)	5 - 4 □
6	Right Scull Lap Pattern	1(24 Stitches)	6 - 1 □
		2(12 Stitches)	6 - 2 □
		3(24 Stitches)	6 - 3 □
		4(24 Stitches)	6 - 4 □
7	Left	Blind	7 - □ □
		L-Stitch	
8	Right	Blind	8 - □ □
		L-Stitch	
9	ROM Pattern (user input pattern)		9 - □ □

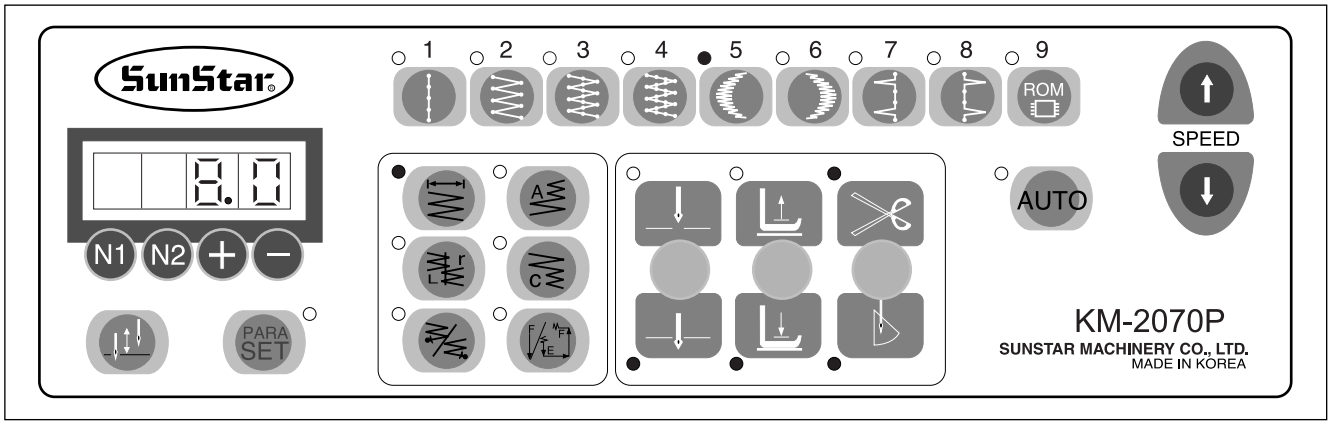


[The Shape of 16 Basic Patterns]

3) Sewing Method of Left/Right Scallop

Ex) Selection shape No. 3 of Left scallop Pattern

■ Operation Panel Indication Status



■ Operation Order

1. Press left scallop key.
   · Indication lamp of left scallop turns on. At the same time, pattern number and shape number are displayed on the indication device and after a moment, zigzag-width is displayed.

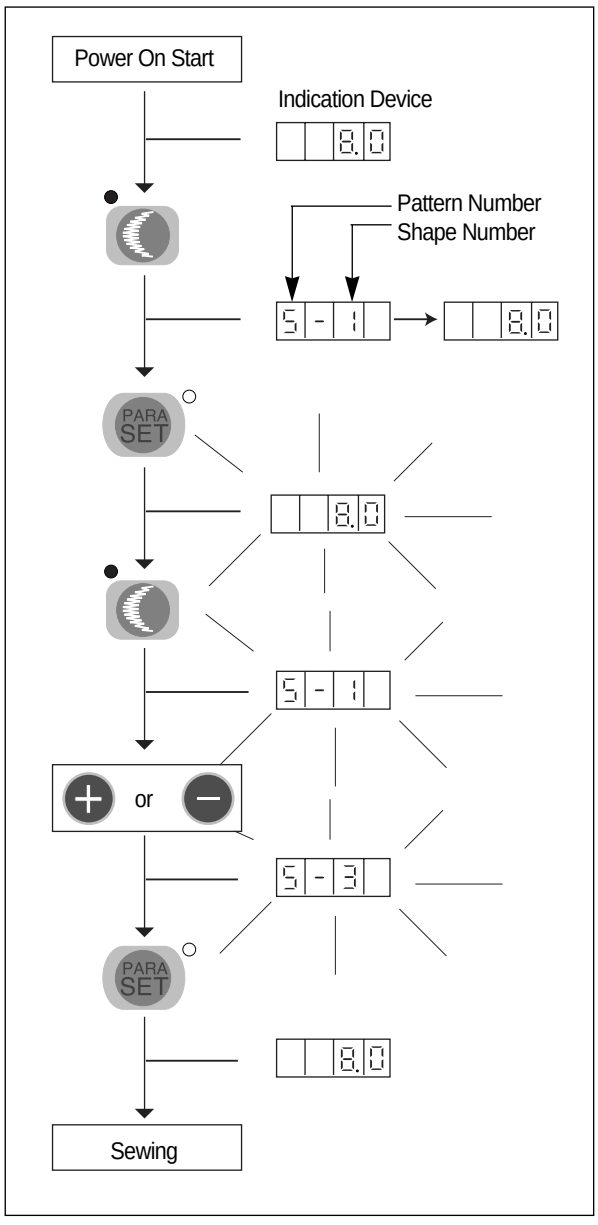
2. Press PARA/SET key in order to change the shape number.
   · ZigZag-width on indication device blinks and at the time, pressing left scallop key, pattern number and shape number are displayed on the indication device.

3. Change the shape number by using + and − key.
   (Ex: selection of pattern shape no. 3)

4. Press PARA/SET key when the change is completed.
   · ZigZag-width is displayed on the indication device.

5. You may start sewing by stepping on the pedal.

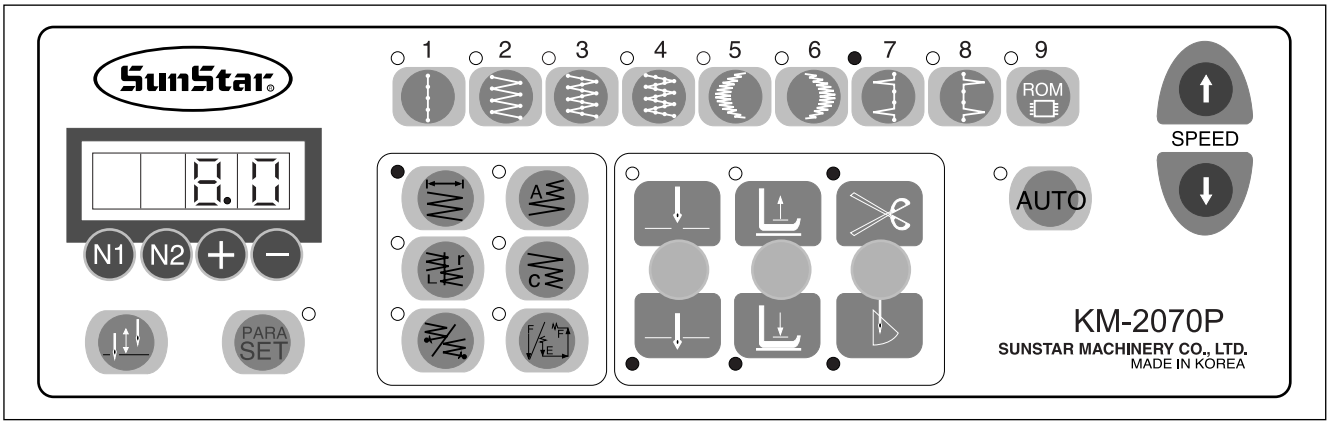
[Note]
· In case of right scallop, it is the same as the operation method above.



4) Sewing Method of Left/Right Blind

Ex) 5 Stitch Setting of Left Blind

■ Indication Status of Operation Panel



■ Operation Order

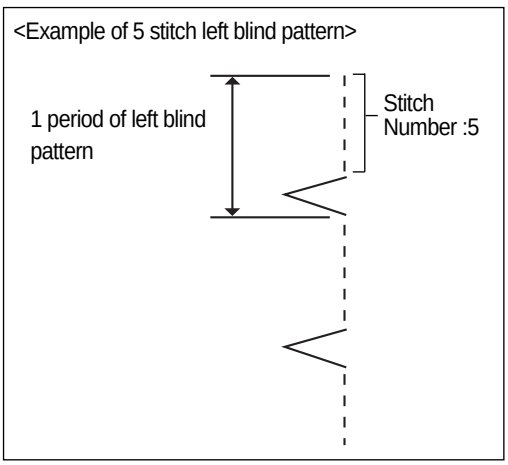
1. Press left blind key.
   - Left blind indication lamp turns on and pattern number and stitch number for left blind are displayed on the indication device at the same time and after a moment, zigzag-width is indicated.

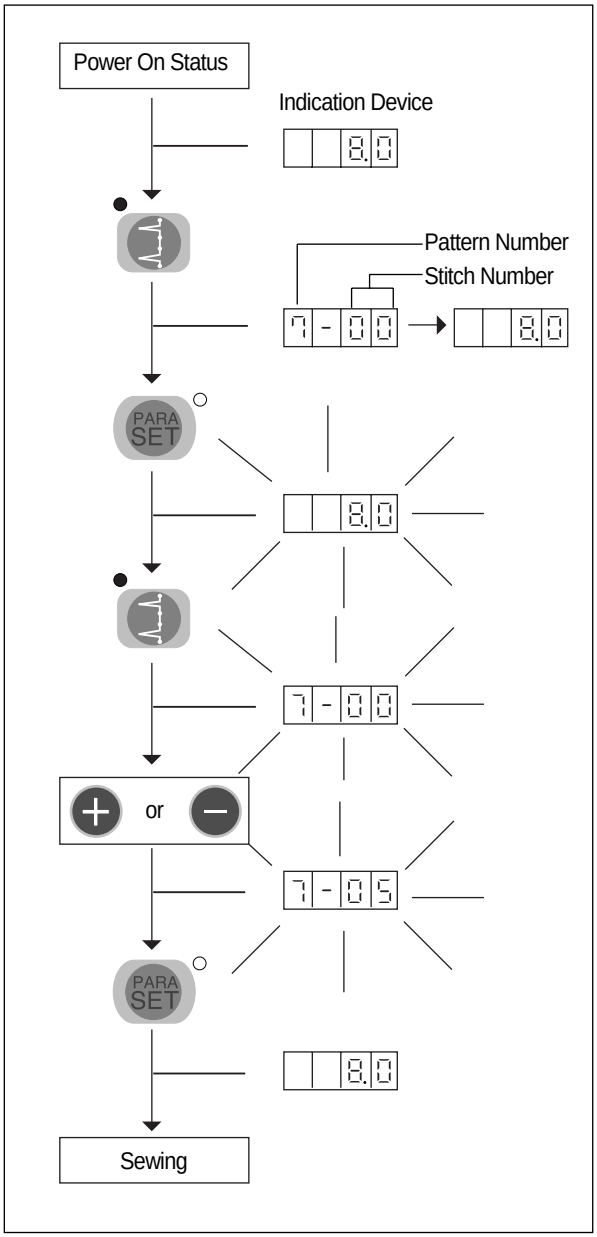
2. Press PARA/SET key to change stitch number of left blind.
   - Display of zigzag-width on indication device blinks. At this time, pressing pattern key of left blind, pattern number and stitch number are displayed.

3. Change the number of stitches by using + and − key. (Ex: 5 stitches)
   Stitch scope of blind : 0~99 Stitch

4. Press PARA/SET key when the change is completed.
   - Width is displayed on the indication device.

5. You may start sewing by stepping on the pedal.

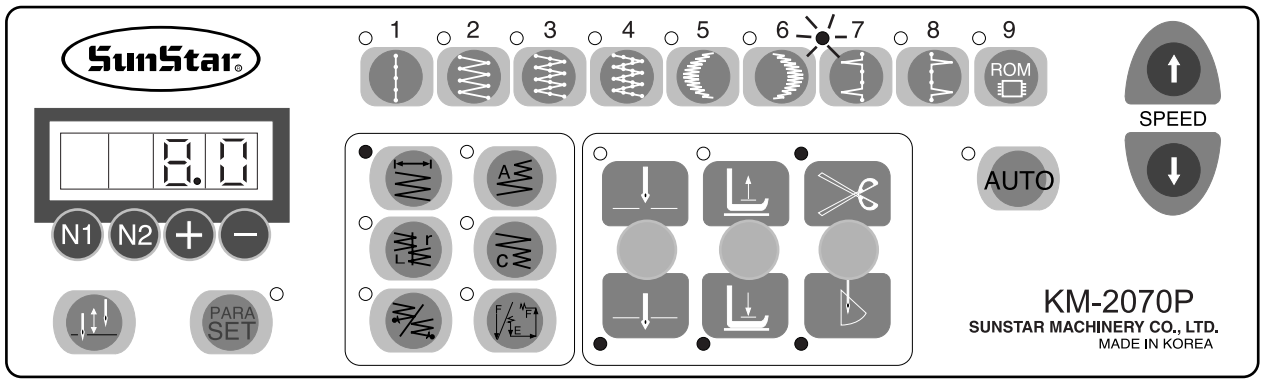




5) Sewing Method of Left/Right L-Stitch

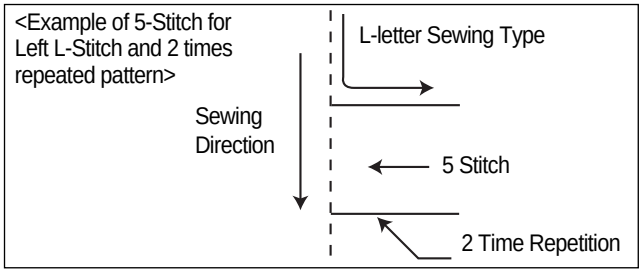
Ex) Set up five stitches for left L-stitch and repeat two times.

■ Operation Panel Indication Status

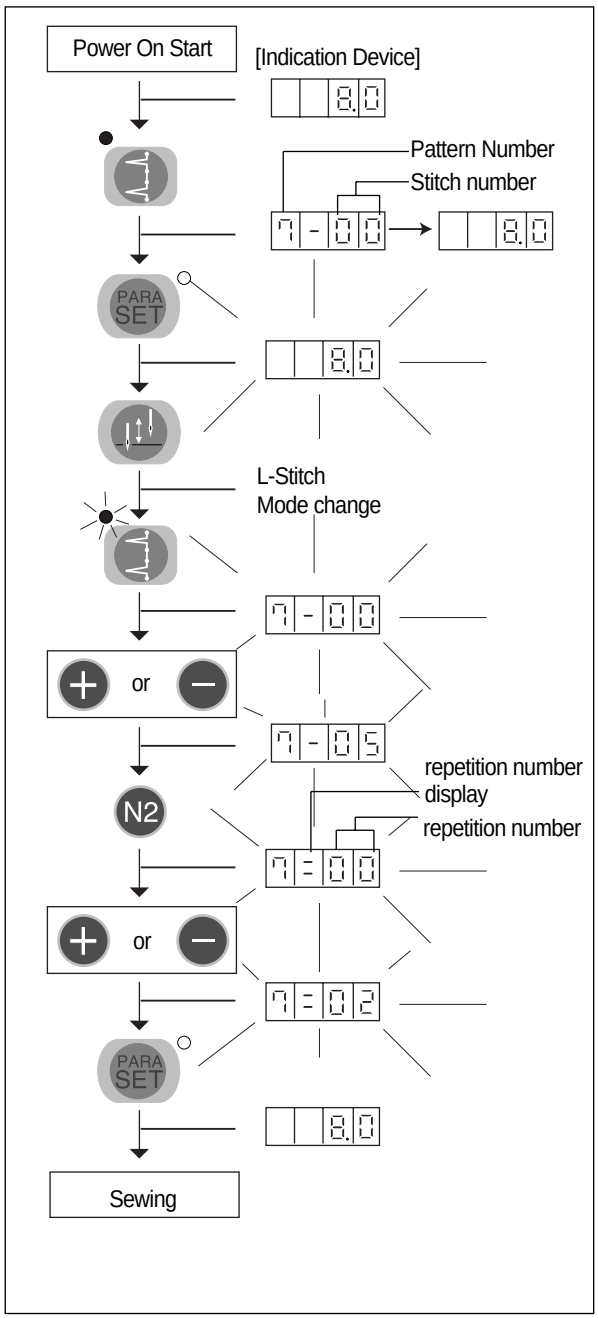


■ Operation Order

1. Press Left Blind key.
   - The left blind display lamp turns on, its pattern number and the number of stitches are displayed on the indication device, then the zigzag-width is displayed.
2. Press PARA/SET key.
   - The zigzag-width blinks on the indication device. At this time, press left blind key, and the pattern number and the number of stitches are displayed.
3. Press Half-stitch key to change into L-stitch pattern mode
   - The left blind display lamp continues to blink to display that it has been changed into L-stitch pattern mode.
4. Use +,- key to change the repeated number of L-stitch. (Ex: 5 stitch)
5. Press N2 key.
   - The repeated number of L-stitch is displayed on the indication device.
6. Use +,- key to change the repeated number of L-stitch.
   - Number of repetition : 2 times (Ex:" 7=02")
7. When the change is finished, press PARA/SET key.
   - The zigzag-width is displayed on the indication device.
8. Press the pedal to start to sew.



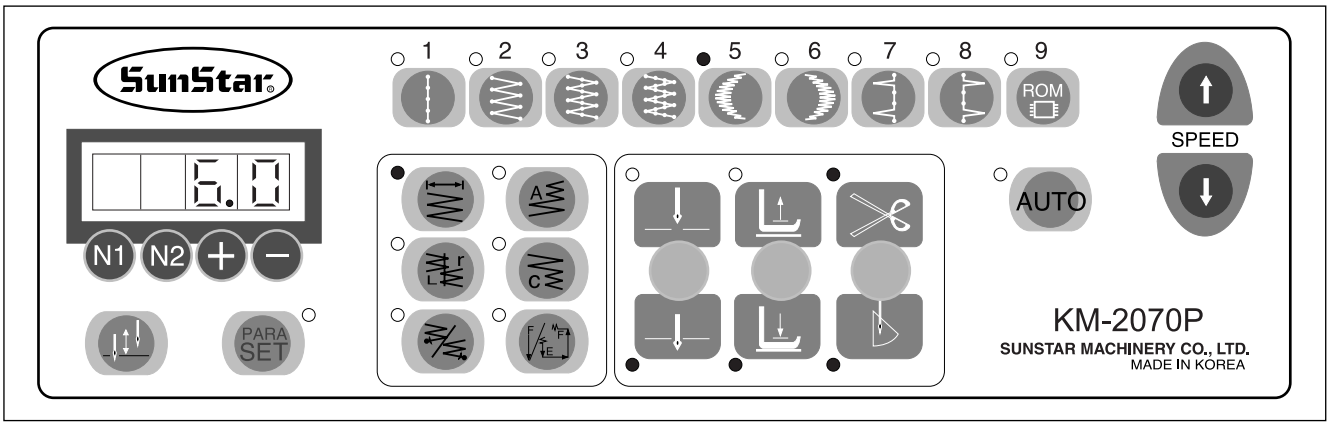
[Note]
- Set up "Condense Adjusting Dial" of the body of sewing machine to "0". (It may be a little adjusted to the direction of +/- according to sewing status)
- According to the sewing results, properly adjust "Sewing Speed" and "Condenser Adjusting Dial")
- L-stitch pattern sewing speed : max 3,000spm



6) ZigZag Width (Max. zigzag-width : 10mm)

Unit) 0.1mm

■ Indication Status of Operation Panel

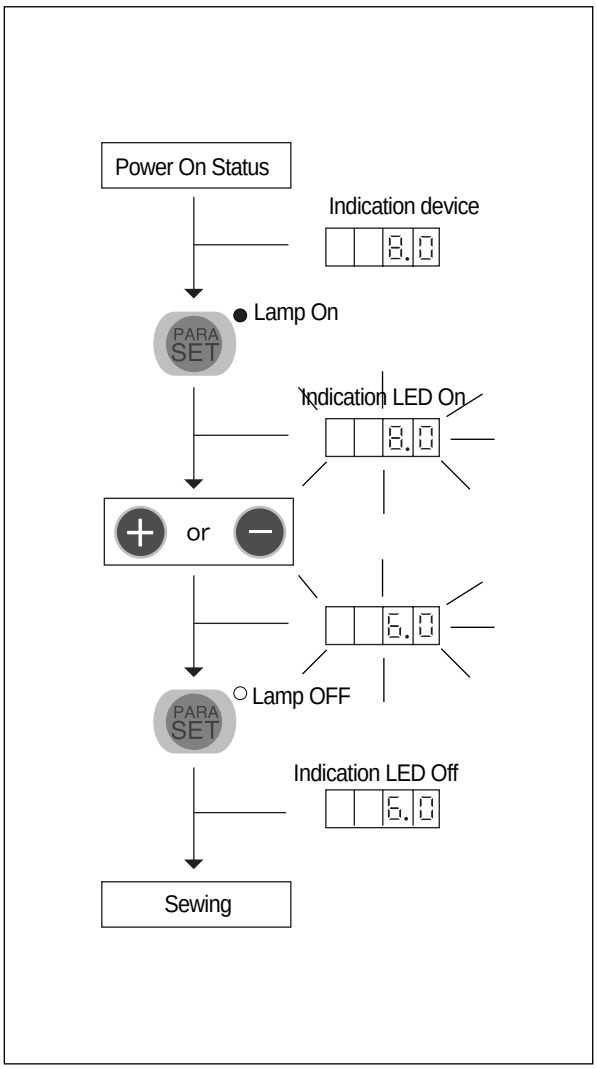


■ Operation Order

※ Status of Power On

- ZigZag-width is displayed on the indication device
- Select the desired pattern shape.
  (Lamp of the selected pattern turns on. Ex: pattern 5) as above picture.

1. Press PARA/SET key to change zigzag-width.
   - Zigzag-width on the indication device blinks.
   - PARA/SET lamp turn on.
2. Change size of zigzag-width by using + and - key.
3. Press PARA/SET key when the change is completed
   - The changed value is set.
   - The changed size of zigzag-width is displayed on the indication device.(Indication device blinks.)
   - PARA/SET indication lamp turn off.
4. Start sewing by pedaling forward.

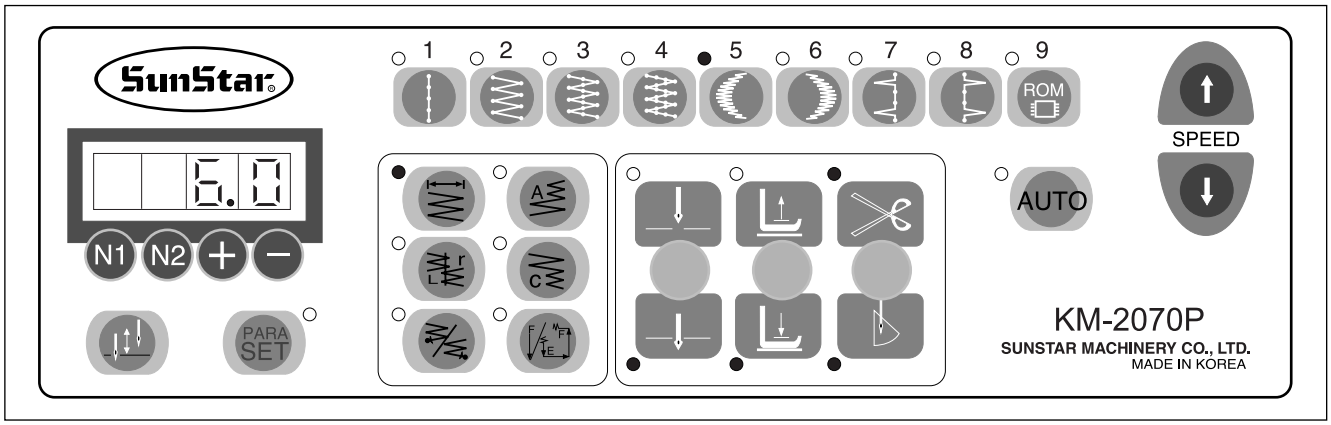


<Note>

- Width of straight-line pattern(pattern number=1) is always '0'.
- Maximum zigzag width is set to 8 mm at the moment of shipping. When using zigzag-width 10mm, change it into "100" on A6 at "5)Parameter changing method and classification" on page 37 and use as well as 10mm gage.
- gage : stopper, needle palter, presser foot, feed dog

7) Sewing Speed

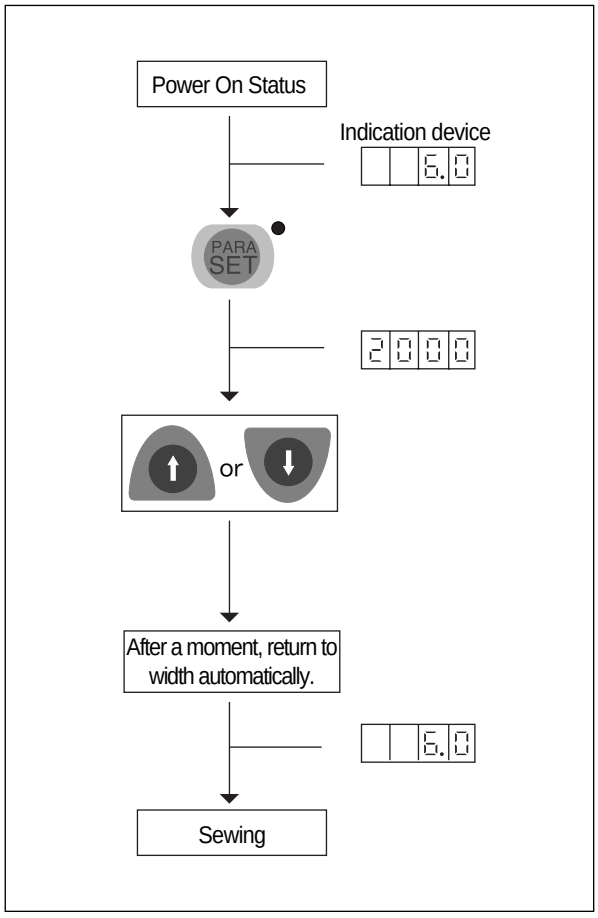
■ Indication Status of Operation Panel



■ Operation Order

· Press speed increase key (arrow direction is up) in order to increase the speed and press speed decrease key (arrow direction is down) in order to decrease the speed.

· The changed speed is on the monitor and then automatically number of with appears.



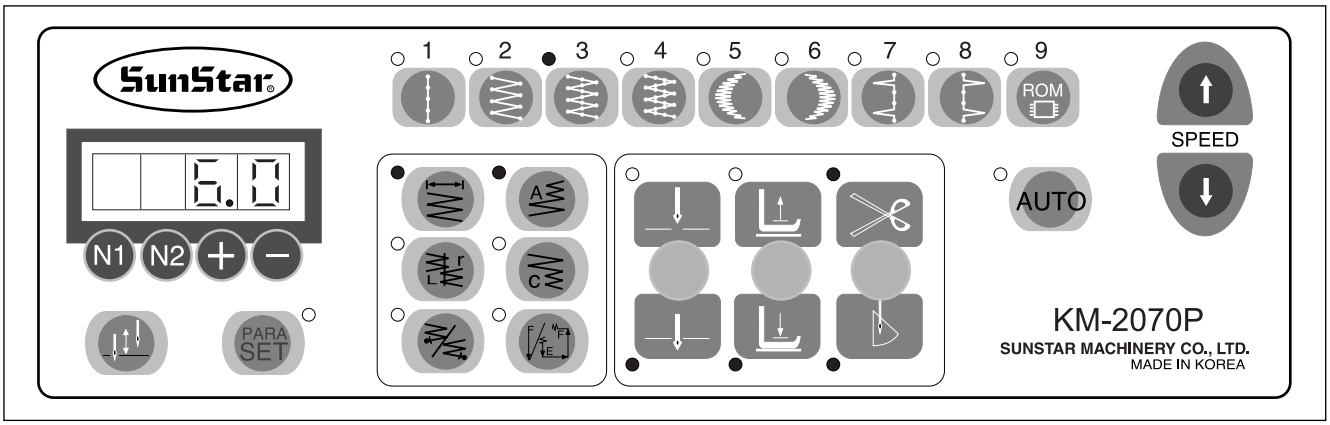
[Note]
Speed limit by ZigZag-Width

		Speed
ZigZag Width	0.0mm~3.0mm	5000 spm
	3.1mm~4.0mm	4500 spm
	4.1mm~5.0mm	4000 spm
	5.1mm~6.0mm	3500 spm
	6.1mm~8.0mm	3000 spm

8) Using method of start condence

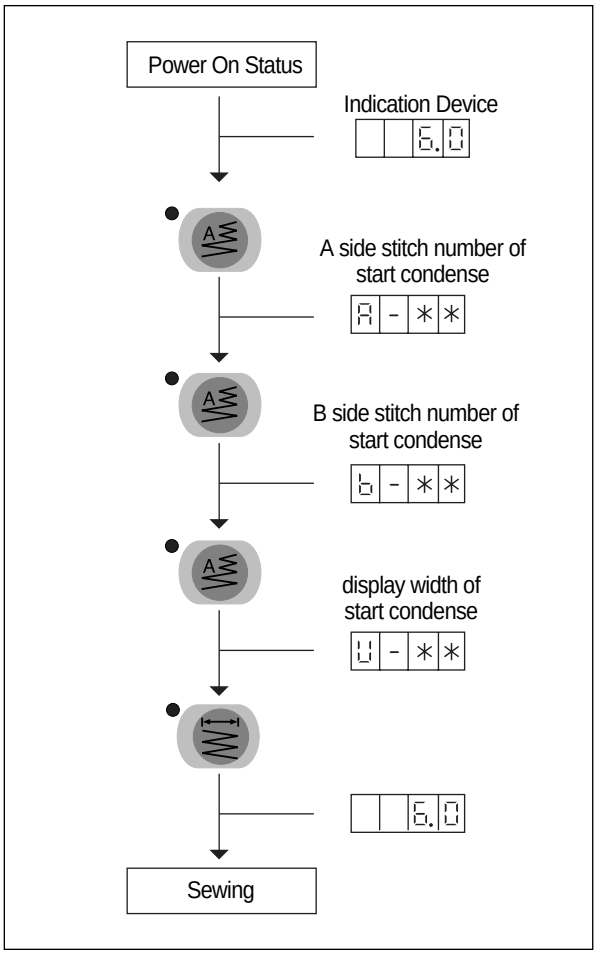
Ex) It is the example of pattern 3 with zigzag-width of 6mm.

■ Indication statas of Operation Panel



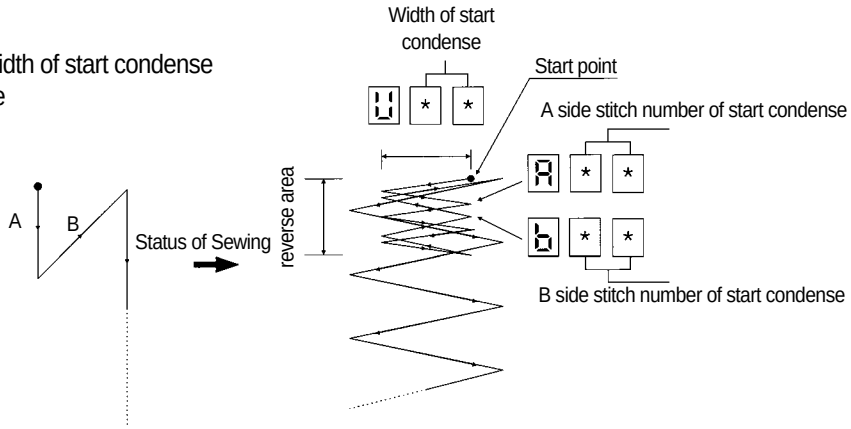
■ Operation Order

1. Press start condense key on condition that power in on.
   - Lamp of start condense turn on, and A side stitch number of start condense is displayed on the indication device.
   - A side stitch number scope : 0~99 [stitch]
2. Press start condense key once again.
   - B side stitch number of start condense is displayed on the indication device.
   - B side stitch number scope : 0~99 [stitch]
3. Press start condense key once again, then width of start condense in displayed on the indication device.
   - width scope : 0~8.0 [mm]
4. Press zigzag-width key.
   - Zigzag-width is displayed on the indication device.
5. Start sewing by pedaling forward.
   - Execute the set start condense, and start sewing the pattern shape.
6. Execute thread trimming by stepping back the pedal when the sewing is completed.



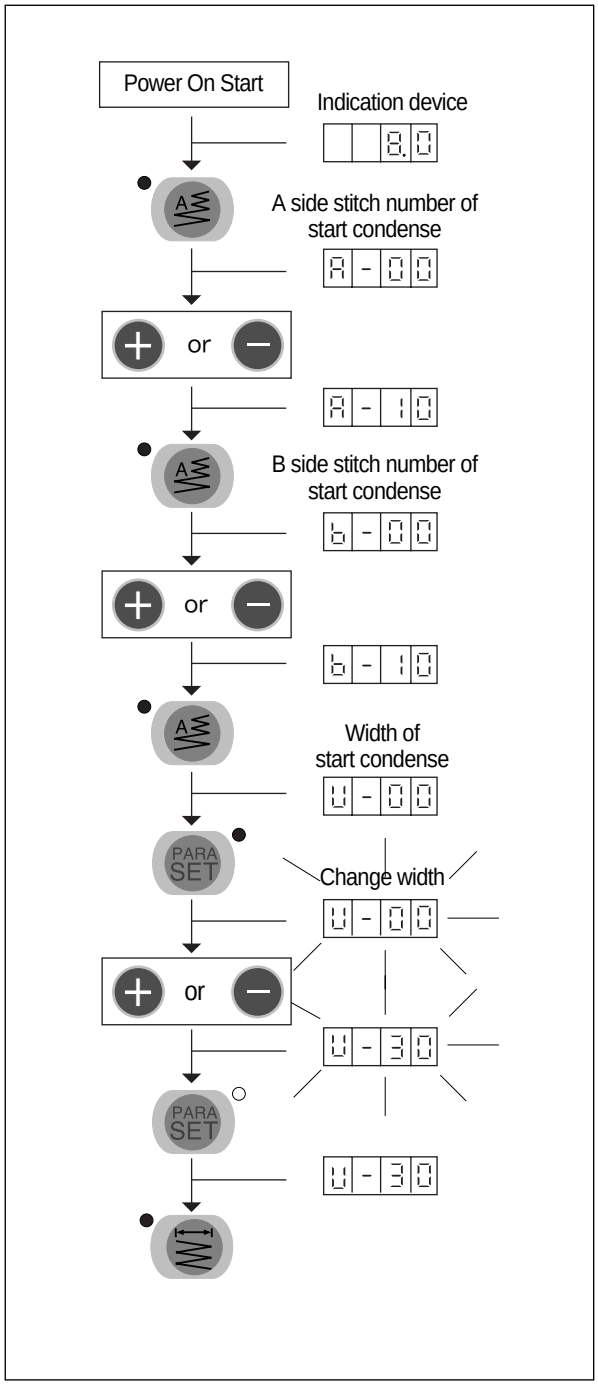
<Caution>
- If you turn on the indication lamp of start condense by pressing start condense key, sewing is possible on that condition as well.
- If you pressed start condense then uses to see the setting status of start condense.
- Adjustment of stitch width (see "3_20") using reverse button.
  A, D side stitch width : setting to feed adjustment dial
  B, C side stitch width : setting to condense adjustment dial

■ Changing stitch number and width of start condense
-Sewing type of start condense



■ Operation order.

1. Press start condense key on condition that power is on
   · Indication lamp of start condense turns on and A side stitch number of start condense is displayed on the indication device.
2. Change the number of stitch by using + and - key.
   (Ex : 10 stitches)
3. Press start condense key once again.
   · B side stitch number of start condense is displayed on the indication device.
4. Change the number of stitch by using + and - key.
   (Ex : 10 stitches)
5. Press start condense key once again.
   · Width U is displayed on the indication device.
6. Press PARA/SET key to change width of start condense.
   · Indication PARA/SET lamp turn on and indication device blinks at the same time.
7. Change the width by using + and - key. (Ex : 3 mm)
8. Set the changed value by pressing PARA/SET key.
   · Width is displayed on the indication device
9. Press zigzag-width key.
   · zigzag width is displayed on the indication device
10. Start sewing by pedaling forward.



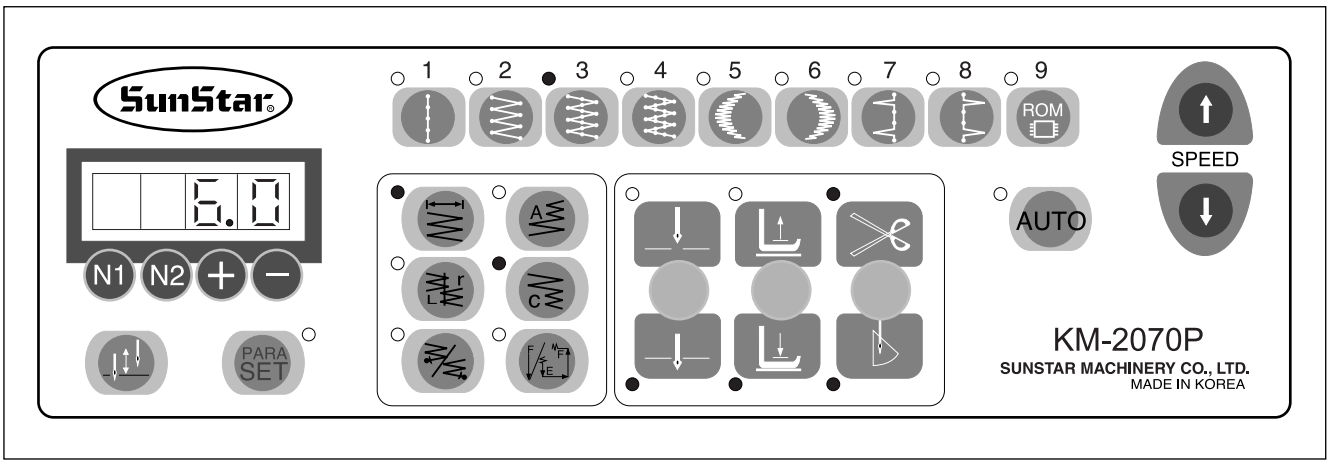
<Note>
A , B side stitch number of start condense : 0～99 [stitch]
width of start condense : 0~8.0 [mm]

<Note>
· Start speed of start condense is 1200spm (in case of sew-speed is above 1200spm) and execute the set sew-speed in case of sew-speed is below 1200 spm.

9) Using Method of End Condense

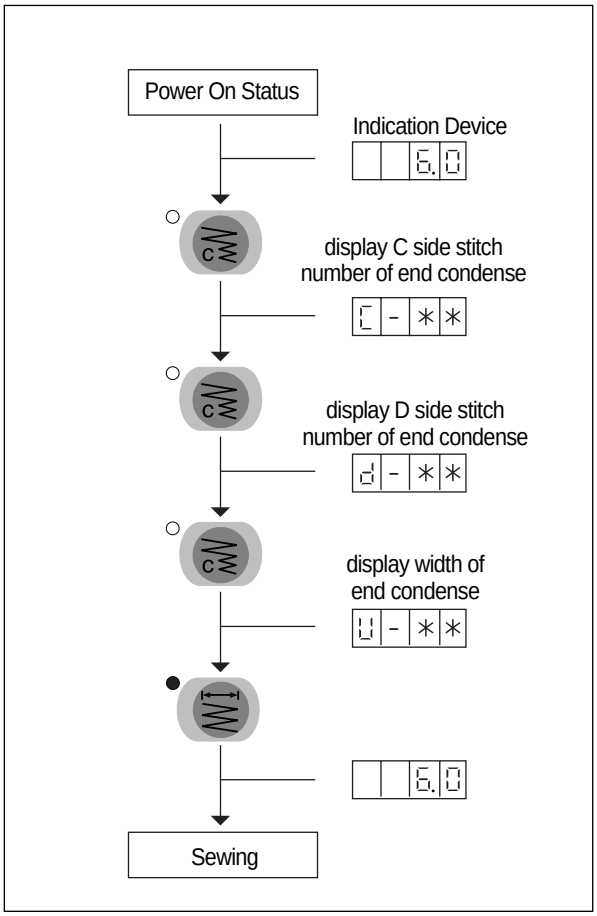
Ex) It is the example of pattern 3 with ZigZag-width of 6mm.

■ Indication Status of Operation Panel



■ Operation Order

1. Press end condense key on condition that power is on.
   - Indication lamp of end condense turns on and C side stitch number of end condense is displayed on the indication device.
   - C side stitch number scope : 0~99 [stitch]
2. Press end condense key once again.
   - D side stitch number of end condense is displayed on the indication device.
   - D side stitch number scope : 0~99 [stitch]
3. Press end condense key once again, then width of end condense in displayed on the indication device.
   - width scope : 0~8.0 [mm]
4. Press zigzag-width key.
   - Zigzag-width is displayed on the indication device.
5. Start sewing by pedaling forward.
6. Execute thread trimming by pedaling back when the sewing is completed.
   - Then end condense executed before thread trimming.

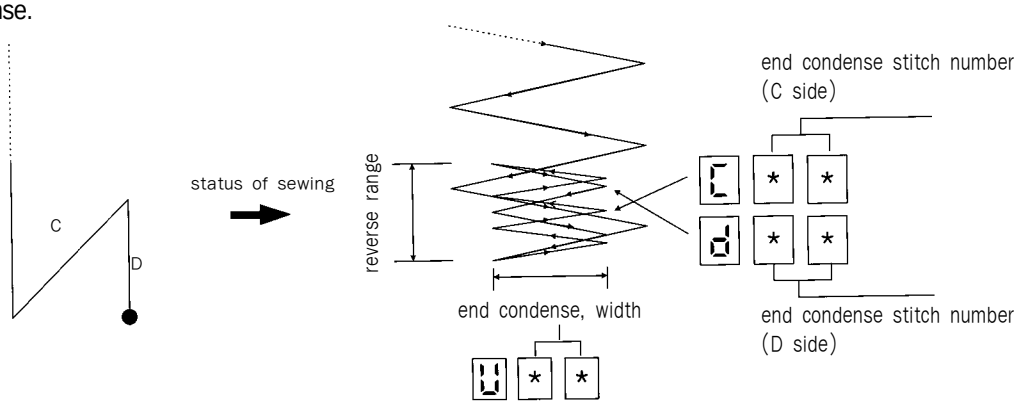


<Note>

- If you turn on the indication lamp of end condense by pressing end condense key, sewing is possible on that condition as well.
- If you pressed end condense then uses to see the setting status of end condense.
- Adjustment of stitch width (see "3_20") reverse button.
  A, D side stitch width : setting to feed adjustment dial
  B, C side stitch width : setting to condense adjustment dial

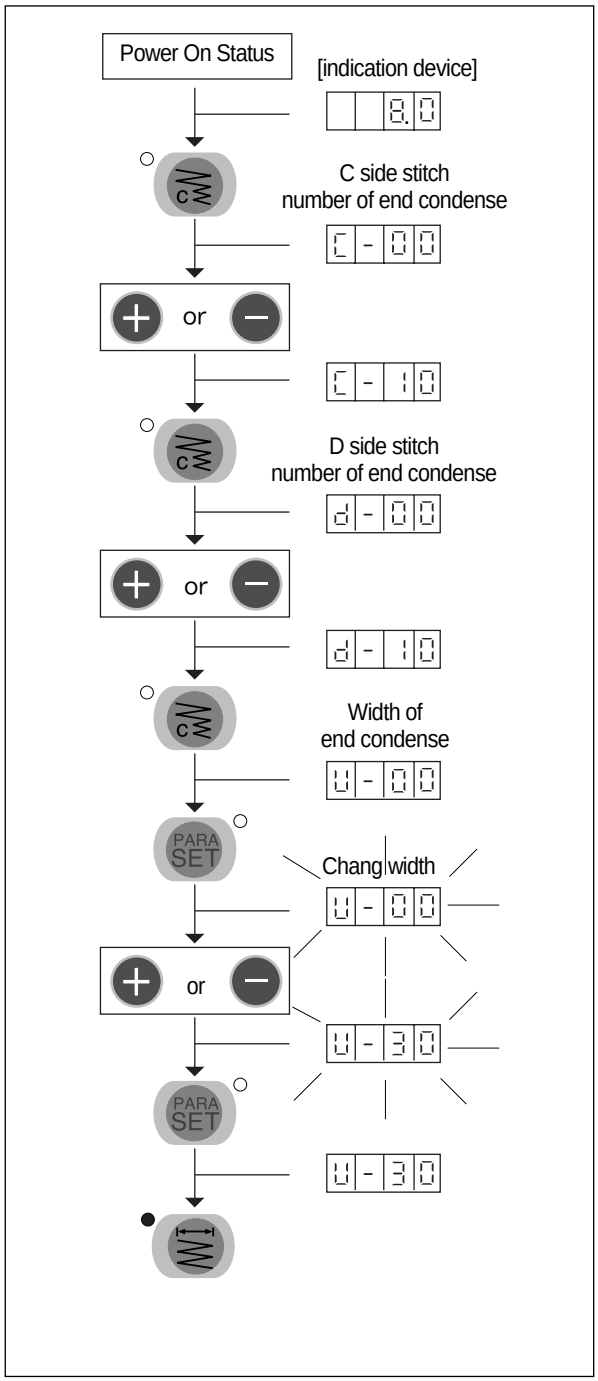
■ Changing stitch number and width of end condense.

Sewing type of end condense.



■ Operation Order

1. Press and condense key on condition that power is on.
   - Indication lamp of end condense turns on and C side stitch number of end condense is displayed on the indication device.
2. Change the number of stitch by using + and - key.
   (Ex : 10 stitches)
3. Press end condense key once again.
   - D side stitch number of end condense is displayed on the indication device.
4. Change the number of stitch by using + and - key.
   (Ex : 10 stitches)
5. Press end condense key once again.
   - Width U is displayed on the indication device.
6. Press PARA/SET key to change width of end condense.
   - Indication PARA/SET lamp turn on and indication device blinks at the same time.
7. Change the width by using + and - key. (Ex : 3 mm)
8. Set the changed value by pressing PARA/SET key.
   - Width is displayed on the indication device
9. Press zigzag-width key.
   - zigzag width is displayed on the indication device
10. Start sewing by pedaling forward.
11. Execute thread trimming by pedaling back when the sewing is completed, then end condense executed before thread trimming.



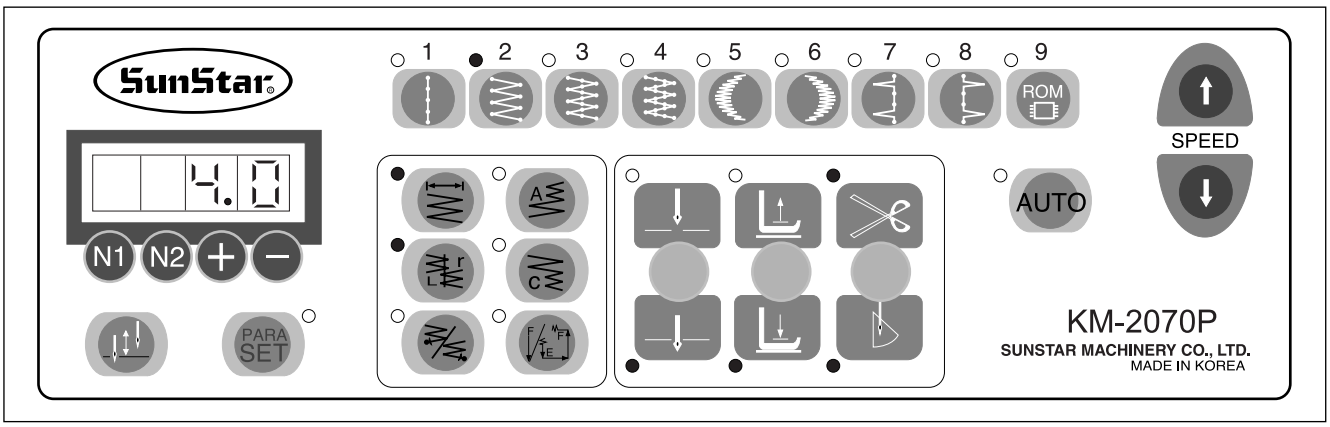
<Note>
C , D side stitch number of start condense : 0～99 [stitch]
width of start condense : 0~8.0 [mm]

<Note>
- Start speed of end condense is 1200spm (in case of sew-speed is above 1200spm) and execute the set sew-speed in case of sew-speed is below 1200 spm.

10) Setting of Base-Line

- Location of base-line is set to '0' at the moment of shipping from factory.
- Lacation of base-line can be set up to 4[mm] in the left and right from on the origin.

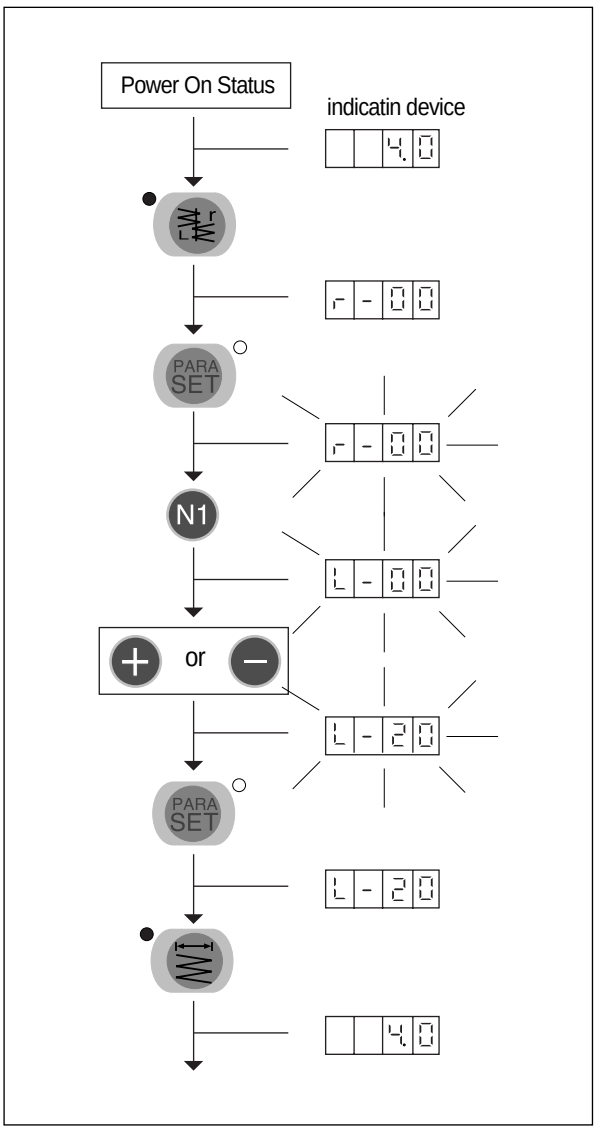
■ Indication Status of Operation Panel



■ Operation Order

Ex) Pattern is set to 2 point zigzag pattern and zigzag width is set to 4[mm] in advance.

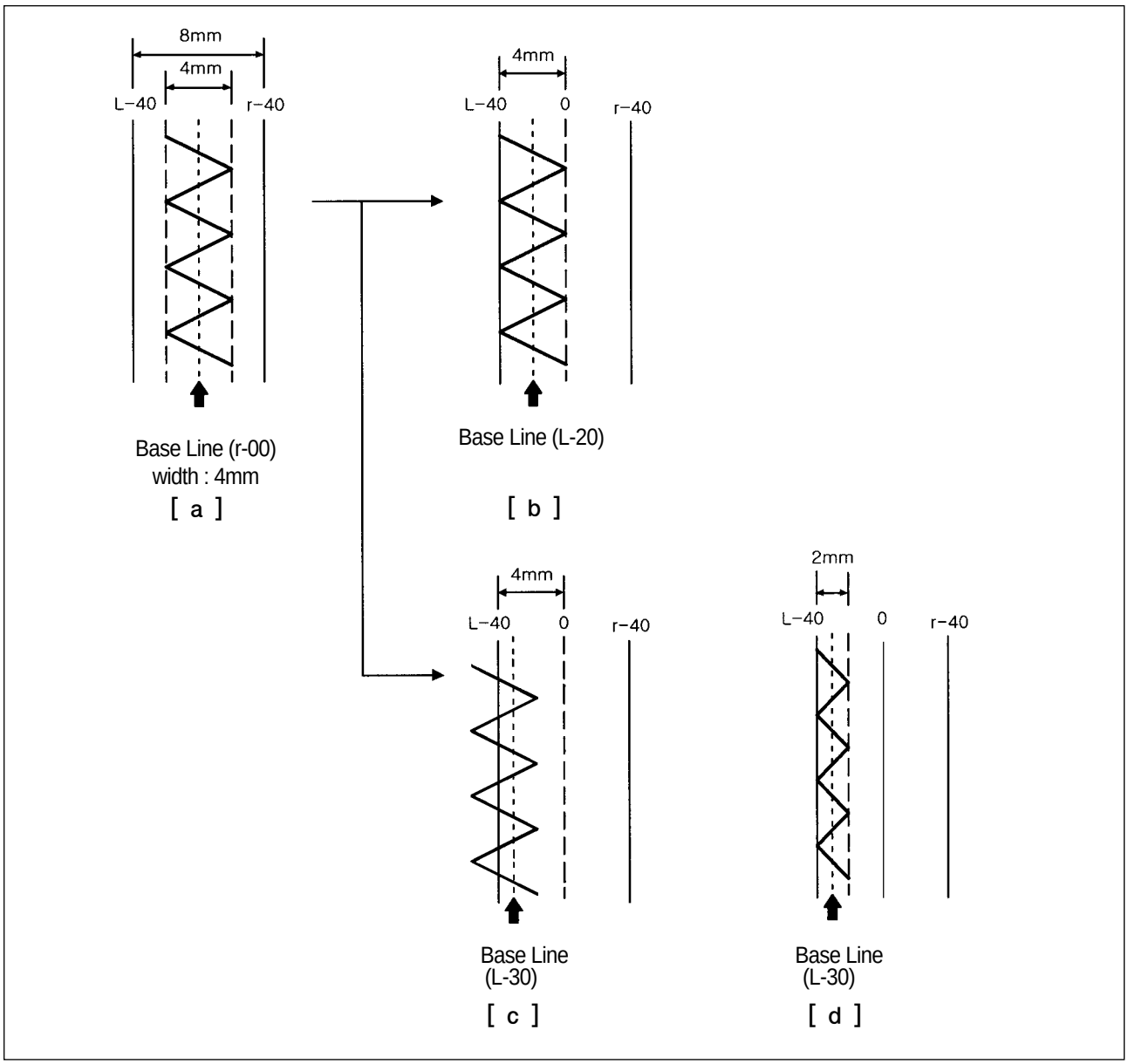
1. Press base-line key.
   - Location of base line is displayed on the indication device
   - Initial location of base line is set to "r-00".
2. Press PARA/SET key.
   - The indication device blinks
3. Decide left and right by pressing N1 key. (Ex : L-00)
4. Change the location by using + and - key. (Ex : L-20)
5. Set the changed value by pressing PARA/SET key.
   - The changed location of base line is displayed on the indication device.
6. Press zigzag width key.
   - Zigzag width is displayed on the indication device.
7. Start sewing by pedaling forward.



■ Considerations to set location of base line

- In the sewing pattern as figure [a], moving the location of base line 2mm (L-20) to the left, it is sewn as shown in the figure [b].
- When moving location of base line 3mm (L-30) to the left and setting zigzag width of 4mm, due to exceeds the sewing range as shown in the figure [c], so zigzag width is automatically set to the maximum range not exceeding the range and sewing is done such.

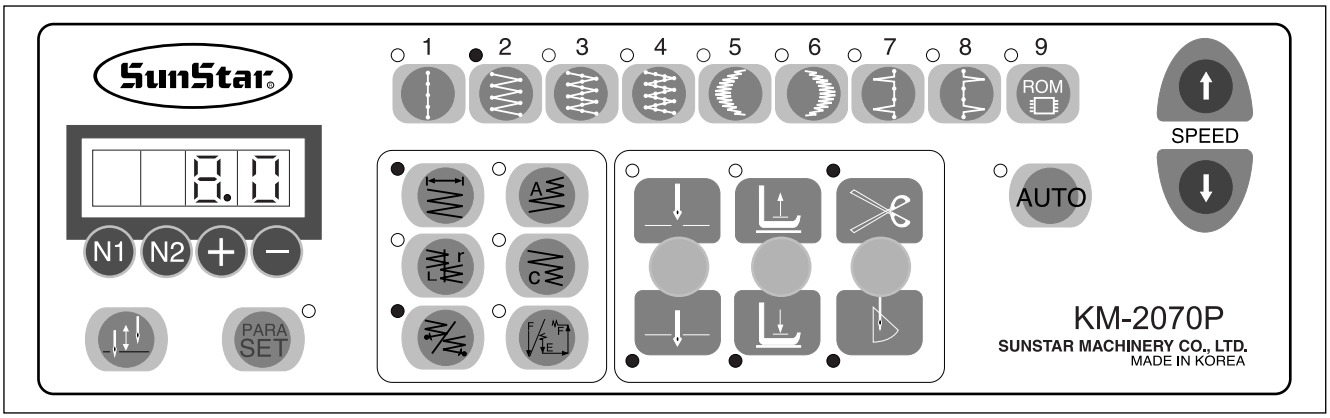
· Yet, setting width of 2mm in this condition, sewing is done s figure [d]



Example of Base Line Setting [Fig. 3-1]

11) Left/Right Stop Location of Needle

■ Indication Status of Operation Panel



■ Operation Order

※ It is the example by 2 point pattern(standard zigzag, pattern number 2) width of 8[mm].

1. Press Needle Left/Right stop key on condition that power is on.
   · Left/Right stop location is displayed on the indication devide.

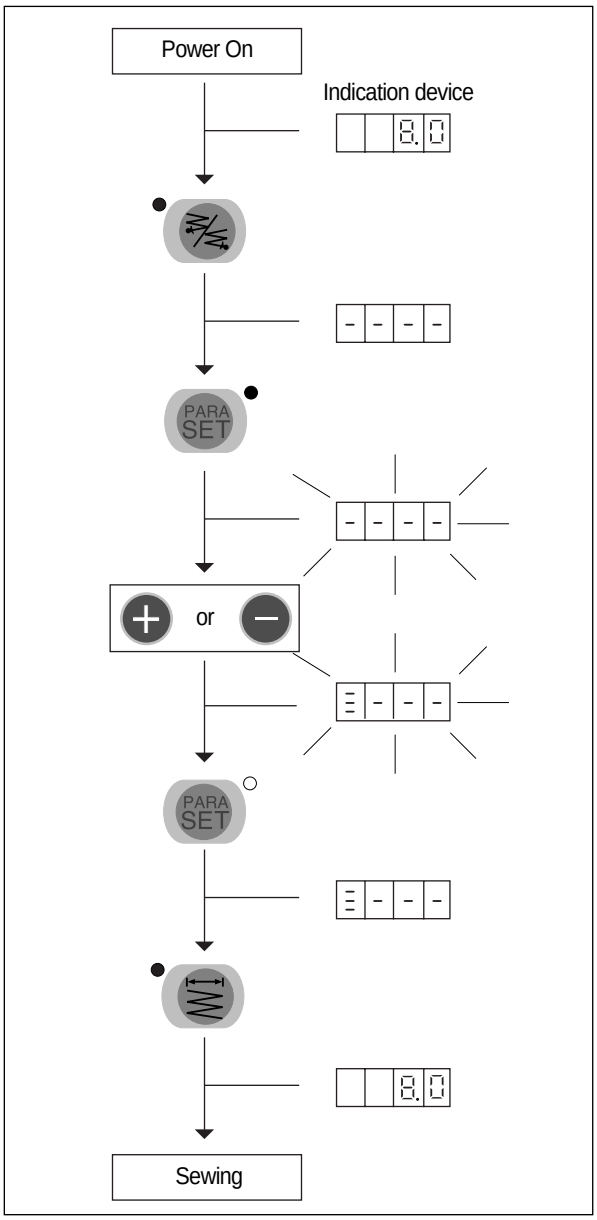
2. Press PARA/SET key.
   · The indication device blinks.

3. Decide left/right stop location.
   · N1 key : left stop indication device:
   · - key : right stop indication device:
   · N2 key : no stop location indication device:

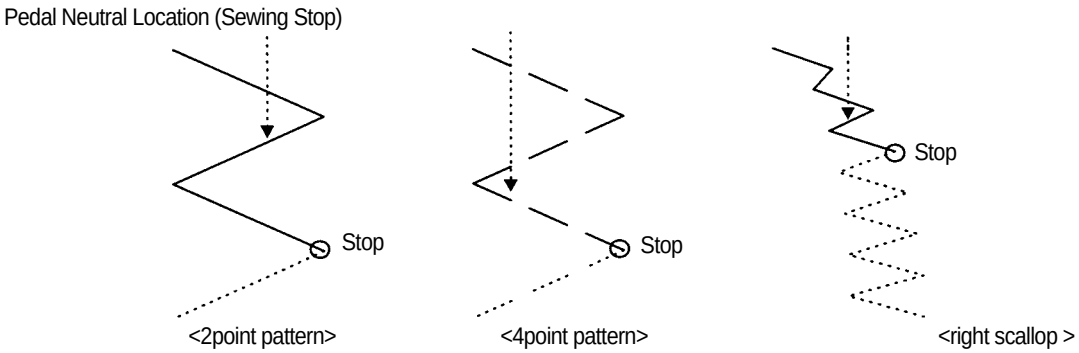
4. Set the changed value by pressing PARA/SET key.
   · The changed stop location is displayed on the indication device.

5. Press zigzag width key.
   · Zigzag width is displayed on the indication device.

6. Start sewing by pedaling forward.



Ex) In case of right stop setting



Example of Needle Right Stop Setting [Fig. 3-2]

<Note>
- Unless set the left/right stop location of needle, it can stop anywhere.
- In case of straight-line pattern and blind pattern, left/right stop location of needle is not reflected.
- Setting left or right stop, though step the pedal to neutral or pedal while sewing, the sewing will continue to the designated location.
- In case of left stop, the machine moves to the maximum left stitch and in case of right stop, it moves to the right stitch.
- In scallop, in case of right stop, the machine moves to the next right stitch and in case of left stop, it moves to the next left stitch.

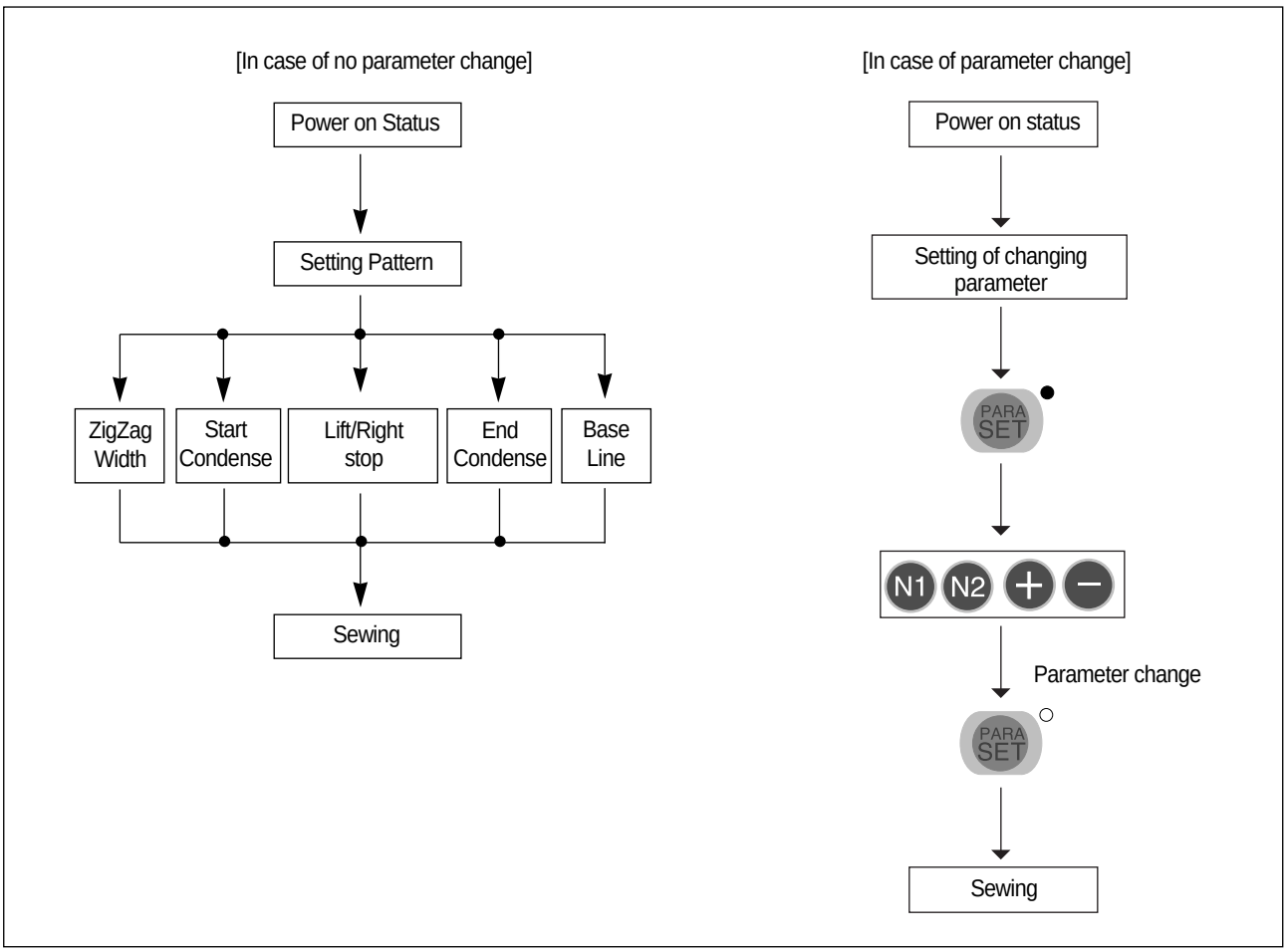
< Sewing start location >
- In case of right stop setting, start from the right and in case of left stop setting and start sewing from the left.
- In case of needle down stop, exchange the sewing material by making the needle to move to needle up stop by pedaling backward and start sewing. Then, it start at the very location.
- In scallop, start sewing from the right in case of left scallop and in case of right scallop, it start from the left (the top of the shape).
- In case of no setting of left/right stop location of needle, sewing starts from the left in case of 2 point, 3 point and 4 point pattern.

<Note>
When moving the needle to the needle up stop location, do not move by turning the half-stitch key or sewing machine pulley by hands. Then, sewing start from left/right stop location of needle becomes invalid

12) Up/Down Stop of Needle

- This setting is used to check location of sewing material correctly or it is usefully used for reverse function(mirror) and name stitch sewing.
- Setting method is to turn on the indication lamp of down stop by pressing up/down stop key of needle.
- It is selected to initial value of down stop.
- In case of up stop, you can just press down stop key once again.

13) Basic Concept for Operation of Operation Panel



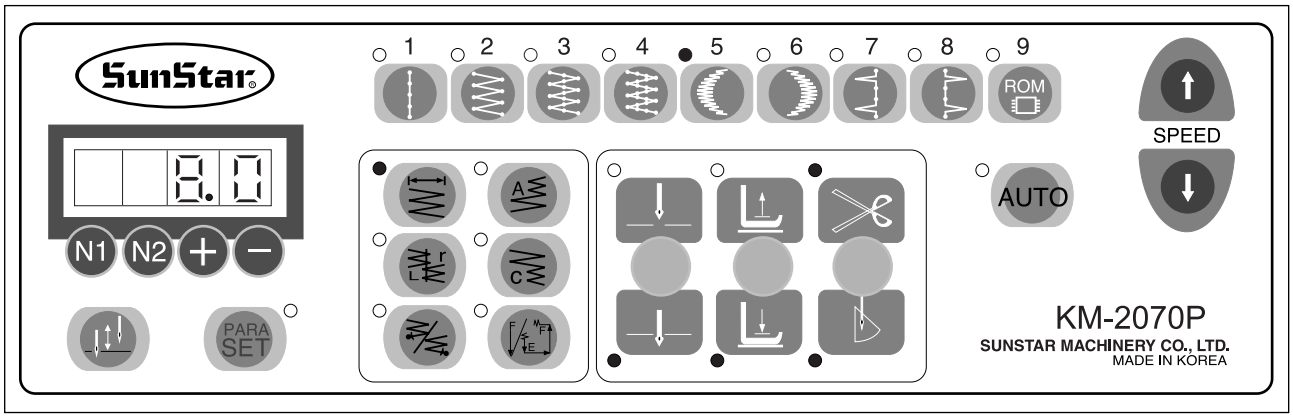
Basic concept of panel operation [Fig. 3-3]

- Use PARA/SET key in order to change the selected parameters (width, base location, left/right stop location, etc.). (See the operation order in case of [parameter change])

- In order to use the set value in advance, turn on the indication lamp by selecting the desired key and start sewing. (Operation order in case of [no parameter change])

14) Reverse (mirror) Function

■ Indication Status of Operation Panel



■ Operation Order

※ Status that power is on.
※ Zigzag width displayed on the indication device.
※ Pattern was set to left scallop No.3 in advance.
※ Needle is at down stop location.

1. Press left scallop pattern key.
   · Pattern number and shape number are displayed on the indication device and after a moment, zigzag width is displayed.

2. Press PARA/SET key.
   · The indication device blinks.

3. Press left scallop pattern key.
   · Indication device blinks and pattern number and shape number are indicated.

4. Select reverse function by pressing N2 key.
   · Indication device continuously blinks.

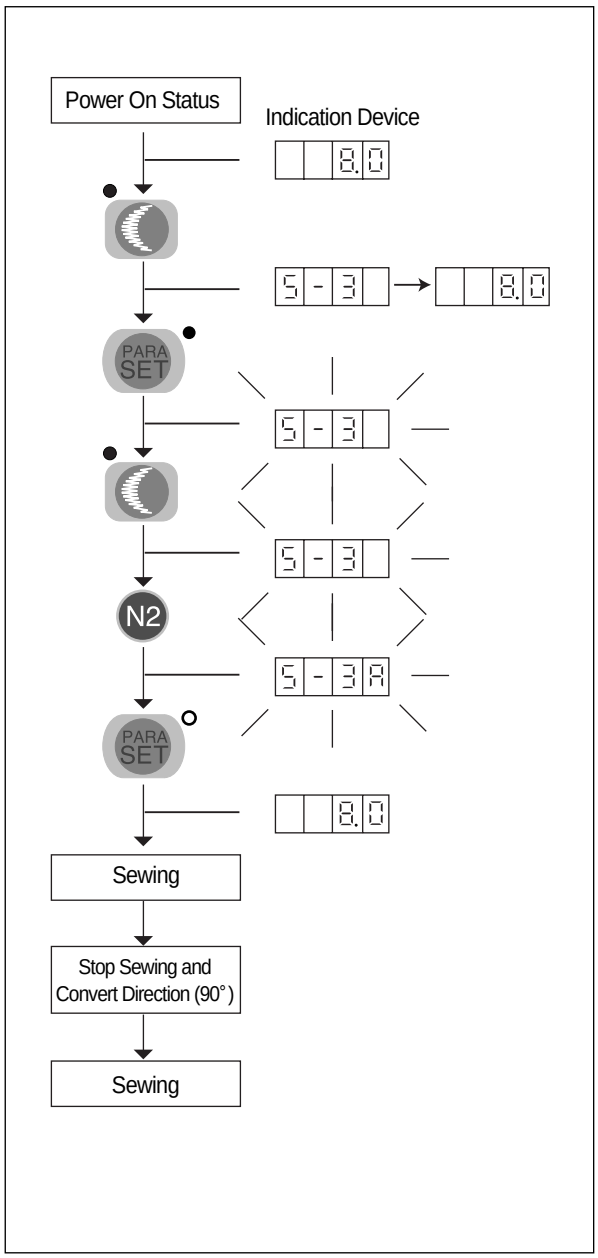
5. Set the changed value by pressing PARA/SET key.

6. Start sewing by pedaling to the front.

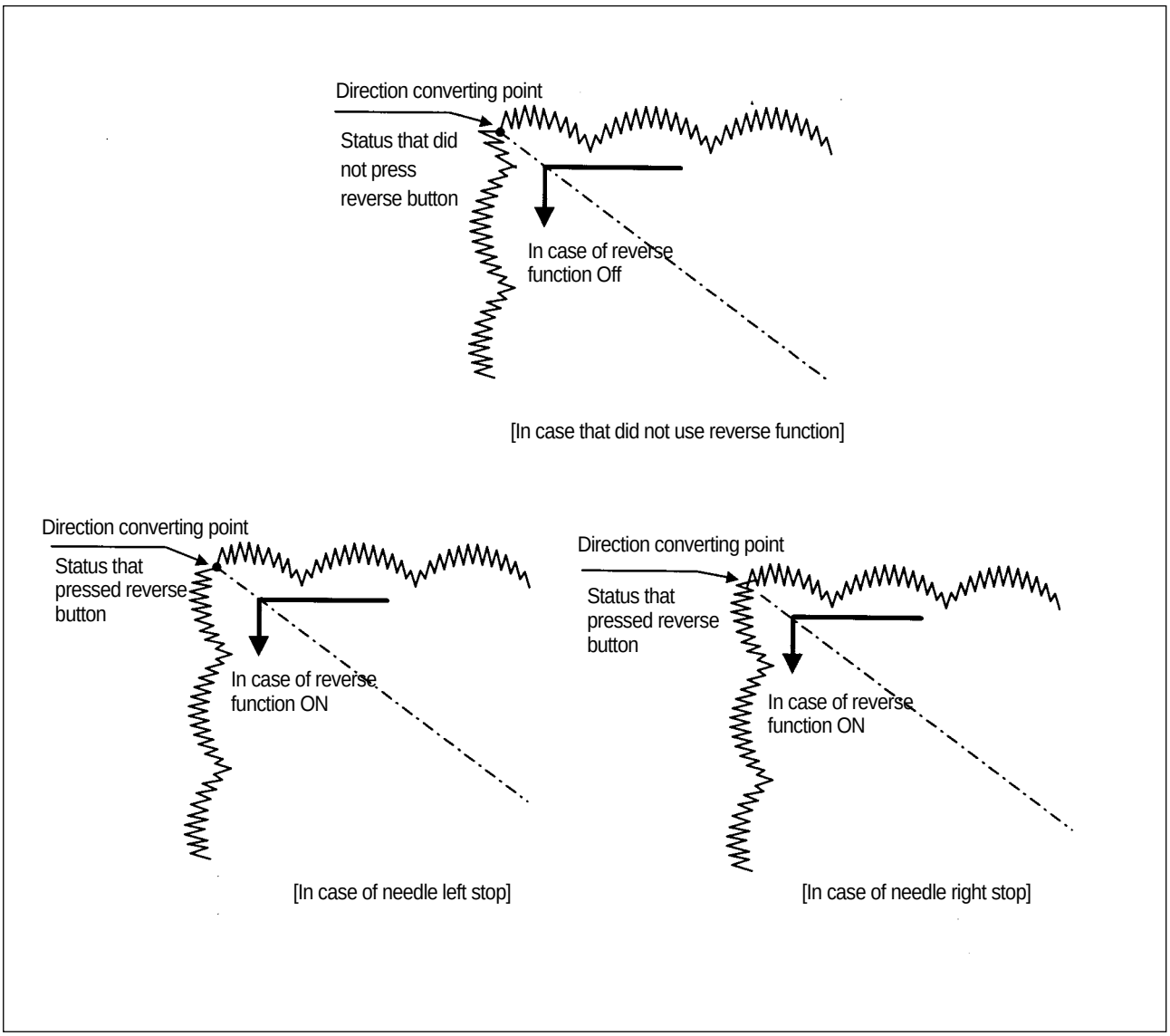
7. Stop while sewing (where reversion is made) and rotate the sewing material to 90°.

8. Set reverse location by pressing reverse button.

9. Start sewing by pedaling to the front again.



■ Example applied use of reverse function

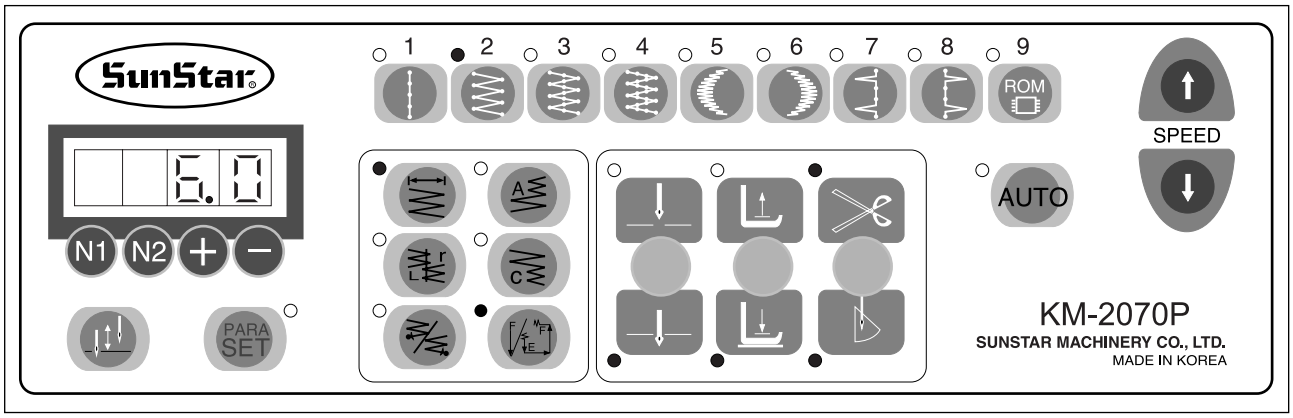

Direction converting point
Status that did not press reverse button
In case of reverse function Off
[In case that did not use reverse function]
Direction converting point
Status that pressed reverse button
In case of reverse function ON
[In case of needle left stop]
Direction converting point
Status that pressed reverse button
In case of reverse function ON
[In case of needle right stop]

Example of reverse function

[Fig. 3-4]

15) Name Stitch

■ Indication Status of Operation Panel



■ Operation Order

1. Press name stitch key on condition that power is on.
   (confirm the set stitch number)
   - Indication lamp of name stitch turns on.
   - pressing one time : display vertical stitch number on the indication device (Ex : E-＊＊)
   - pressing twice : display horizontal stitch number on the indication device (Ex : F-＊＊)
   - pressing three times : cancel name stitch

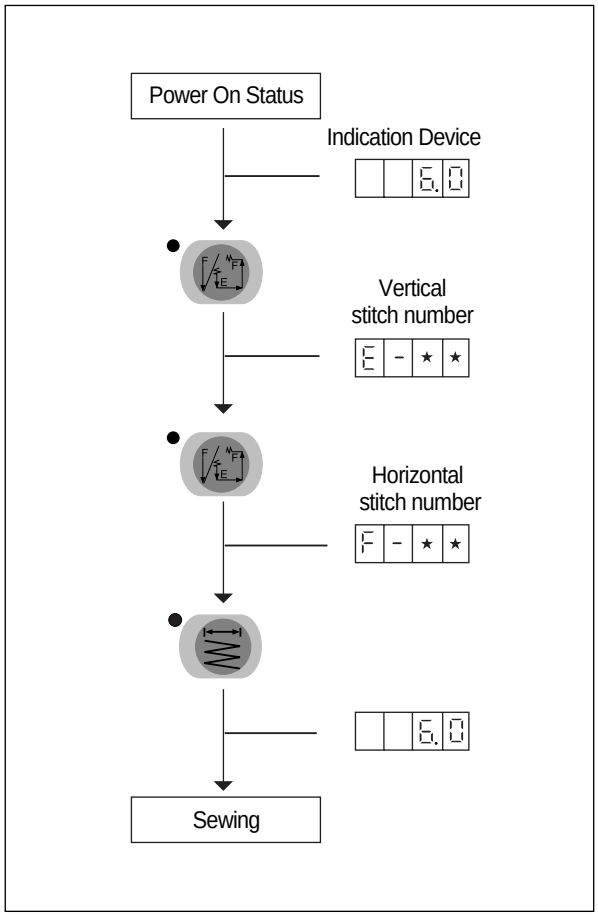
2. Press zigzag width key
   - Zigzag width is displayed on the indication device.

3. Step or the pedal forward.
   - Sew as much as the set stitch number and then stop. (vertical stitch number)

4. Convert direction and step the pedal again.
   - Sew as much as the set stitch number and then stop. (horizontal stitch number)

5. Repeat stage 3~4.
   - Stop when the sewing in completed.

6. Perform thread cutting by pedaling backward.



<Note>
- Sewing is possible even on condition that vertical stitch number (E sewing) was set only.(thread trimming is possible)
- Turning the lamp on by pressing AUTO key, the machine sews as much as the set stitch number upon you pedal once. And when sewing is completed, it executed thread trimming automatically.

■ Change of vertical stitch number(E) and horizontal stitch number (F) of name stitch
- pattern number : 2 point pattern
- zigzag width : 6mm

1. Press name stitch key on condition that power is on.
   · Indication lamp of name stitch turns on and vertical stitch number is displayed on the indication device.

2. Change the vertical stitch number by using -and - key.
   (Ex : vertical 20 stitch (E-20))

<Note> After changing vertical stitch number, upon pedaling sewing is possible. (sewing E vertical stitch number)

3. Press name stitch key again.
   · Horizontal stitch number(F) is displayed on the indication device.

4. Change the horizontal stitch number by using + and -key.
   (Ex : horizontal 30 stitch (F-30))

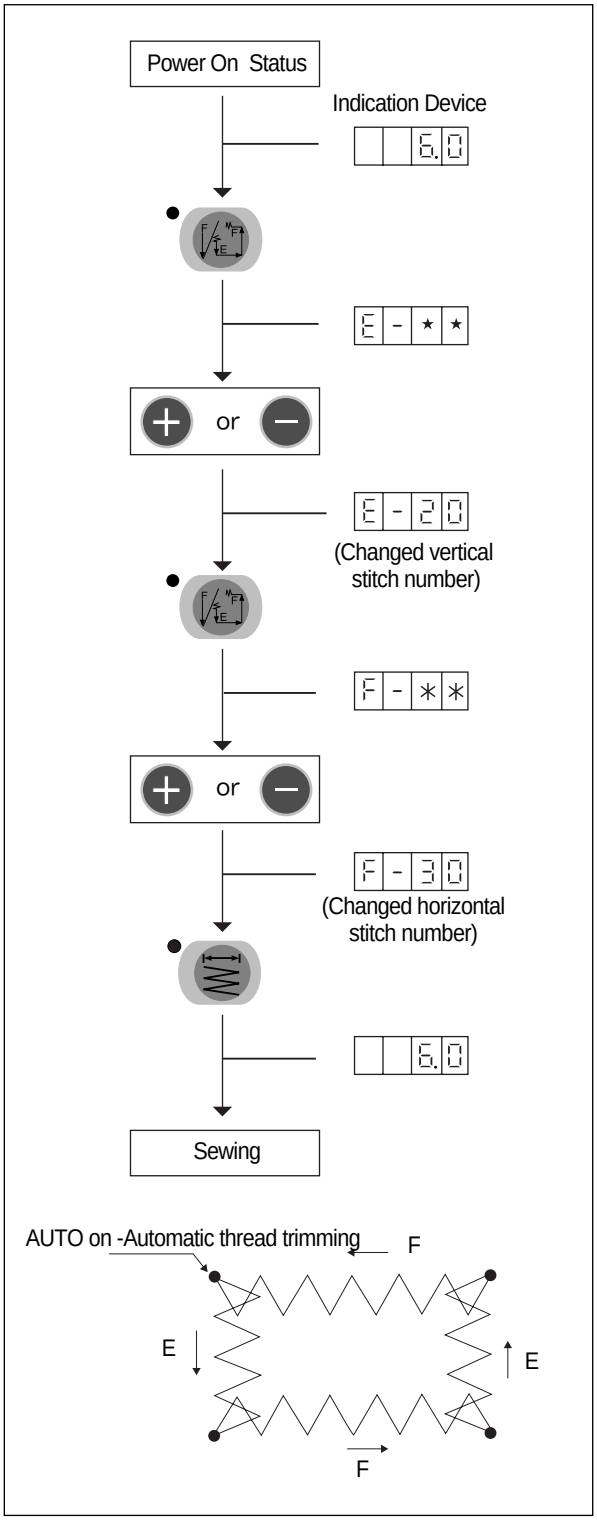
5. Press width key.
   · Zigzag width is displayed on the indication lamp.

6. Sew by pedaling
   · Sew as much as the set stitch number and the stop.
   (E : vertical stitch number)

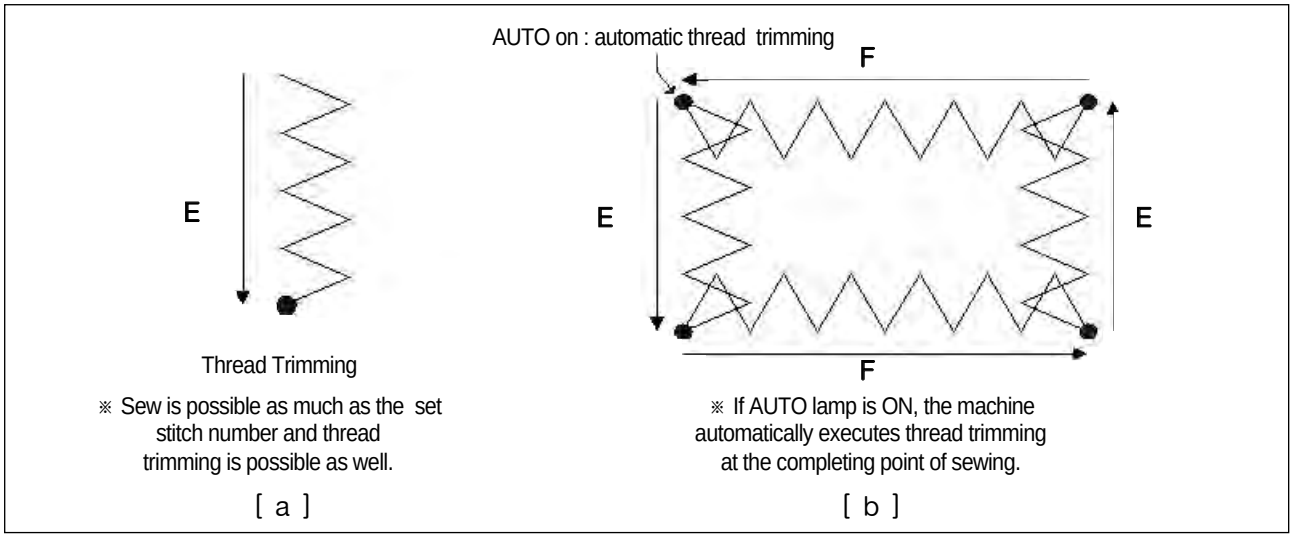
7. Convert direction and step the pedal again.
   · Sew as much as the set stitch number and then stop.
   (F : horizontal stitch number)

8. Repeat stage 6 ~ 7.
   · Stop when sewing is completed.

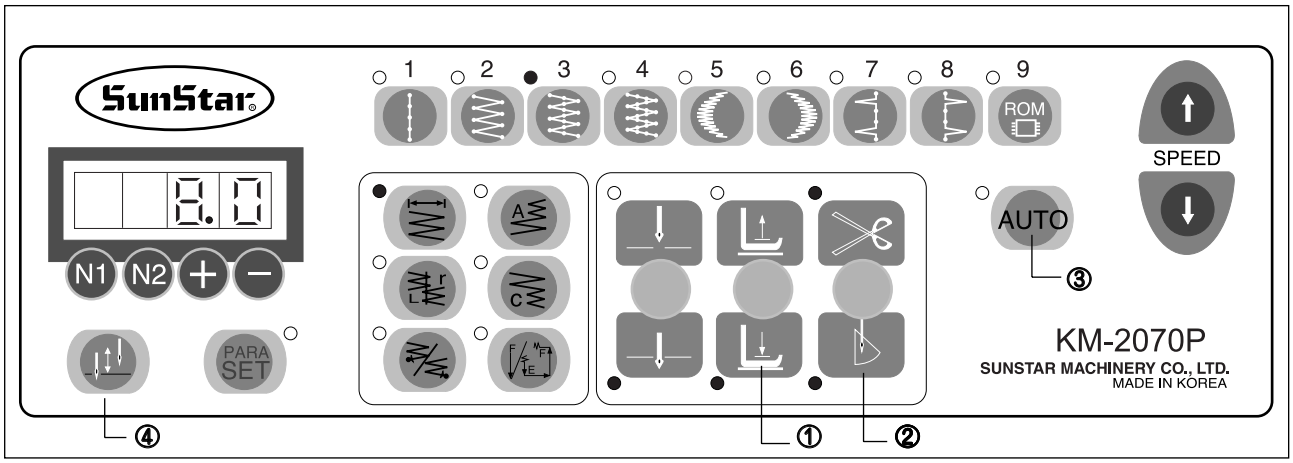
9. Perform thread trimming by pedaling backward.



<Note>
· You can separately do E sewing (vertical stitch number setting). (see [Fig.3-5] a)
· Automatic stop to the set stitch number is possible and thread trimming is possible.
· Stop the needle at the four corner of b in [Fig.3-5] and sew the cloth by pedaling after rotating 90°. (vertical and horizontal stitch number can set to maximum 99 stitch.)
· Using AUTO key, the machine execute sewing as much as the set stitch number upon you pedal once and execute thread trimming automatically.


AUTO on : automatic thread trimming
E
F
E
E
F
Thread Trimming
※ Sew is possible as much as the set stitch number and thread trimming is possible as well.
[a]
※ If AUTO lamp is ON, the machine automatically executes thread trimming at the completing point of sewing.
[b]

E (vertical stitch number) sewing and name stitch sewing [Fig. 3-5]



Status of Operation Panel [Fig. 3-6]

16) Deciding Presser Foot Up/Down Location

1. Turn on the power.
   - Indication lamp of presser foot down turns on.(presser foot falls down thread trimming.)
2. Press presser foot up/down(①) key to change.
   - Indication lamp of presser foot up turns on. (presser foot always rises thread trimming.)

17) Thread trimming and Wiper function

1. Turning the power on, functions of thread trimming and wiper are all selected.
2. In order to remove this function, turn the indication lamp off by pressing thread trimming/wiper key (②).

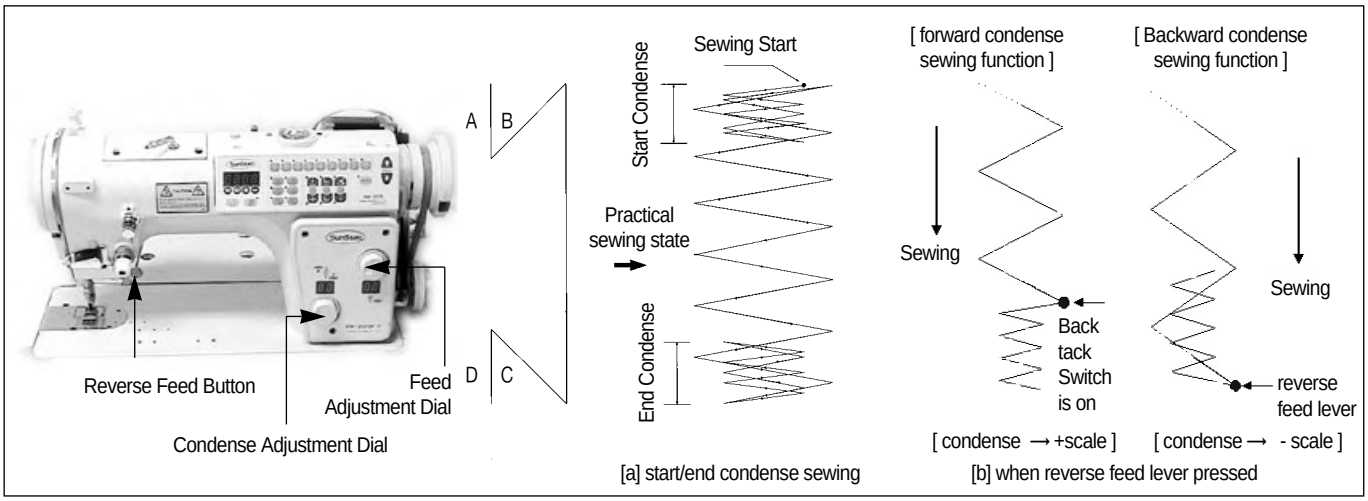
18) AUTO

In case of name stitch sewing, turning the indications lamp on by pressing AUTO key(③), the machine sews to the set stitch number by stepping the pedal once automatically and it also perform automatic thread trimming after completing last sewing. (completing sewing of the set vertical stitch number.)

19) Half Stitch Operation

- When the sewing machine stopped, pressing the half stitch operation key (④), the machine performs half stitch sewing at low speed.
- speed of half stitch sewing: 100 spm

20) Using Reverse Feed Control Lever and Using Reverse Button(A Button)



■ Condense (BackTack) Function
- Used to prevent the fabric loosening at start and end of sewing work.
  · During sewing, if you press reverse feed button, then performs to condense sewing by the setting value(adjustment of stitch width by condense adjustment dial and feed adjustment dial), while you pressed the reverse feed button. (in case of [Fig. b])
  · Condense sewing is start and end condense sewing.([Fig. a])

■ Feed adjustment dial and condense adjustment dial
< In case of condense sewing >
  · Feed adjustment dial : adjustment of A, D side stitch width
  · Condense adjustment dial : adjustment of B, C side stitch width
< In case of reverse feed button>
  · Feed adjustment dial : stitch width
  · Condense adjustment dial : (Right Direction : forward condense function)(Left Direction : backward condense function)

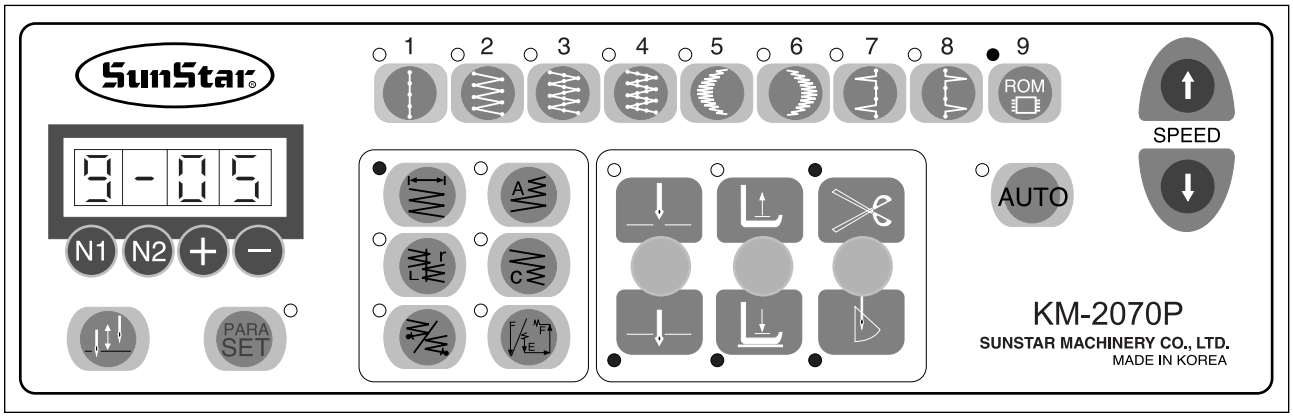
<Note> Feed adjustment dial > Condense adjustment dial

■ Reverse Button Function
- To sew Mirror Reverse Shape is available during sewing.
  · While pattern shape is set up to '5-*A' or '6-*A', place the pedal to the neutral position during sewing, press reverse button , and 'AAAA' is displayed on the indication device and reverse sewing is available. (Whenever reverse function is used, reverse button must be used.)
  · If you press reverse button at a mistake during sewing stop, press reverse button once more, and mirror reverse function disappears completely.
  · While pattern shape is set up to '5-*A' or '6-*A', during sewing, if you press reverse feed button, then performs to condense sewing by the setting value(adjustment of stitch width by condense adjustment dial and feed adjustment dial), while you pressed the reverse feed button.

<Caution> · When deciding width, if needle plate is for 8mm, width scope can set up to -4mm～4mm. When setting the width scope to -5mm~5mm, it digresses work scope and the needle can be broken. In this case, use by setting the maximum width to 10mm. See "zigzag width" in article 3-6).

21) Rom Pattern (Use Pattern) Input Method

■ Indication Status of Operation Panel



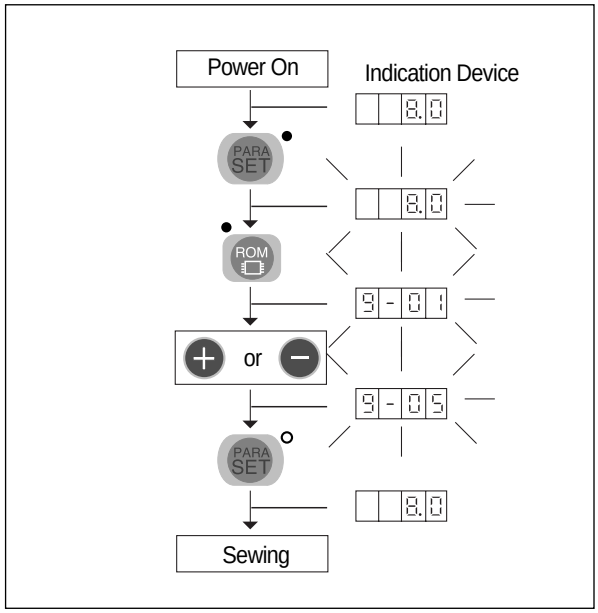
■ Operation Order

1. Press PARA/SET key.
   · Indication device blinks.

2. Press ROM pattern key.
   · ROM pattern number and pattern shape number are displayed on the indication device.
   (indication device blinks continuously)

3. Select ROM pattern shape number by using + and - key.
   (Ex : 9-05)

4. Press PARA/SET key.
   · ROM pattern number and pattern shape number are displayed on the indication device.
   (indication device does no blink)



22) Formatting

■ Formatting

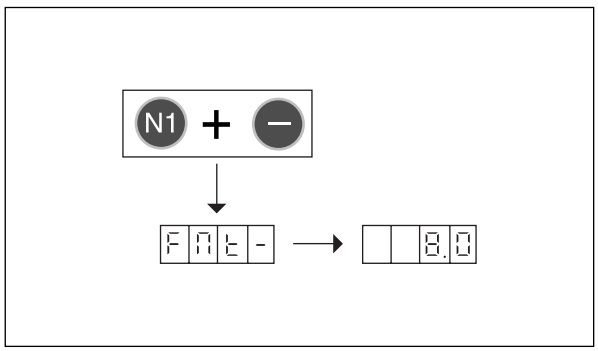
· Turn on the power with pressing N1 key and - key.

· Indication device displays as shown in the figure and after a moment, width is displayed on the device and then becomes sewing available status.

<Note>

· EEPROM is formatted status at the moment of factory shipping. If it is not formatted, the machine can normal function in case of setting use input pattern.

· Also use when you want to delete all the input content

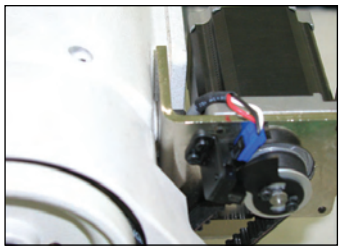


23) Method of Setting the Starting Point

KM-2070P B/T Starting Point Setting Flow

As in the existing KM-2070P model, perform the setting of machine and install the control box.

1) Install the B/T motor and starting point sensor.
2) Connect the B/T motor and the starting point sensor cable.
3) Install the Dial O/P and connect the cable to the digital B/D.
4) Adjust to make the starting point sensor film positioned at the center of the sensor with the value of motion reading "0".



Turn the power on. Check the right and left starting points of the needle bar, and the front and back starting points of the B/T.

Starting point of the needle bar (OK?)

NO → Adjustment of the starting point of the needle bar

YES

1) Select No.1 straight line pattern.
2) Set the forward and reverse stitch length of the Dial O/P at "0".
3) Insert a piece of paper and check to see if the paper is being pushed back and forth when manually turning the pulley.

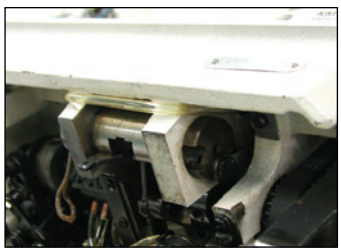
Is the paper being pushed back and forth?

NO → 1) Perform the basic adjustment by adjusting the starting point sensor film position.
2) Set the starting point again by repressing No.1 pattern key.

YES

〈 To set at name stitch 〉
Value of the E-side : 99stitch
Value of the F-side : 0 stitch
Auto function is on

1) Insert the paper and press the pedal to start sewing (99 stitches will be sewn).
2) Readjust the starting point sensor film position according to the degree of paper being pushed.



Is the paper being pushed back and forth?

NO → 1) Perform the minute adjustment by adjusting the eccentric pin of the feed regulator.
2) Reset the starting point by pressing N0.1 pattern key.
3) Perform the sewing again.

YES

1) Select No.7 L-stitch pattern (set the vertical stitch at 4 and the horizontal stitch at 2)
2) Conduct the sewing test against the 10 basic expanded patterns.

Is the sewing status is good?

NO → 1) Perform the minute adjustment by adjusting the eccentric pin of the feed regulator.
2) Reset the starting point by pressing No.1 pattern key.
3) Perform the sewing again.

YES

The setup of the KM-2070P B/T starting point is completed.

4

Error Indications and Action Plan

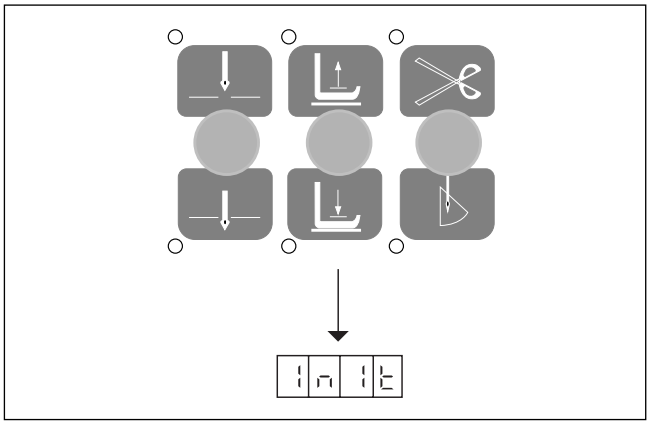
error code	Content	Check error
Er06	X origin check error	· Check badness of connector connection · Check badness of X origin sensor
Er66	Y origin check error	· Check badness of connector connection · Check badness of Y origin sensor
Er09	Pattern prohibit error	· Input pattern data editing
61	Synchronizer error	· Check badness of synchro connector connection · Check badness of welding
128	Encoder off line error	· Check badness of connector connection
129	Over load	· Badness main motor connection
130	Synchronizer signal error (sewing machine lock)	· Check synchro signal

5

Others

1) Initialization of Machine

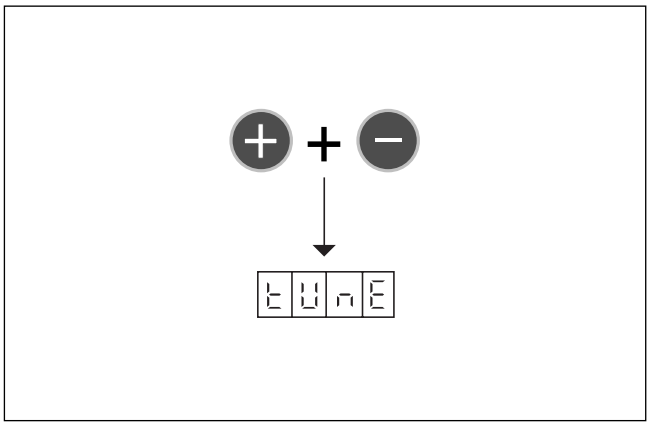
1. Turn on the power with pressing needle Up/Down key, presser foot up/down key and thread trimming/wiper key.
2. Indication device displays [I][n][I][t] and after a moment, width is displayed. Then, initialization is completed.



2) Inertia Tuning

1. Turn on the power with pressing +key and − key.
   · Indication device displays [t][U][n][E]
2. Stepping on the pedal, the machine automatically performs inertia tuning.
   · It performs driving and controlling 8 times by itself.

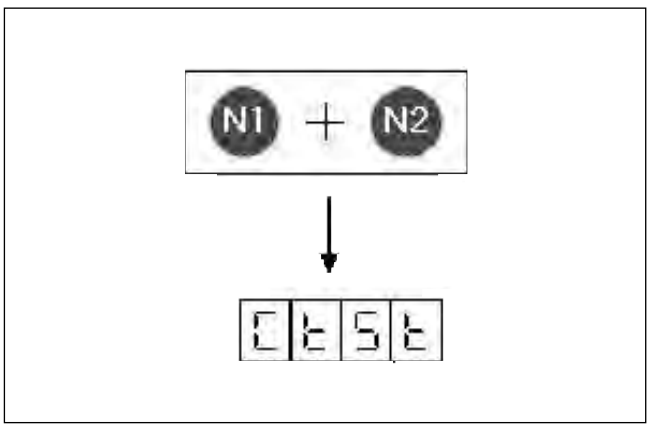
<Note> As the needle bar stops at optional location after performs inertia tuning, turn the power on and off



3) Hook Test Function

※ It is the function to match hook timing.

1. Turn on the power with pressing N1 and N2.
   · Indication device is displayed as shown in the figure.
2. Match hook timing by turning pulley by hands.
3. Pressing PARA/SET key, the machine converts to sewing available status.

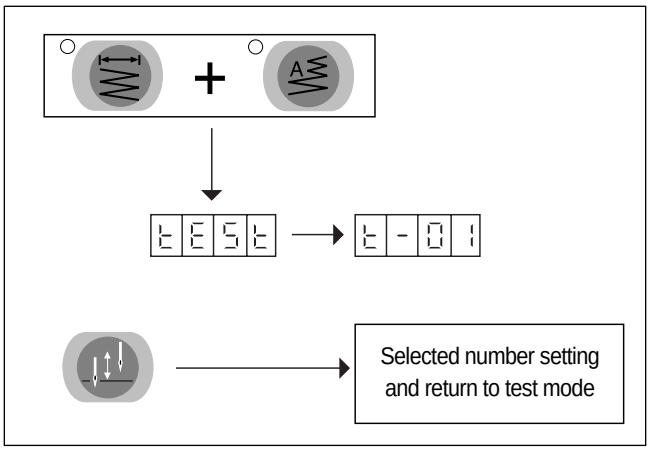


4) Machine Test Function

■ Test Mode and Description

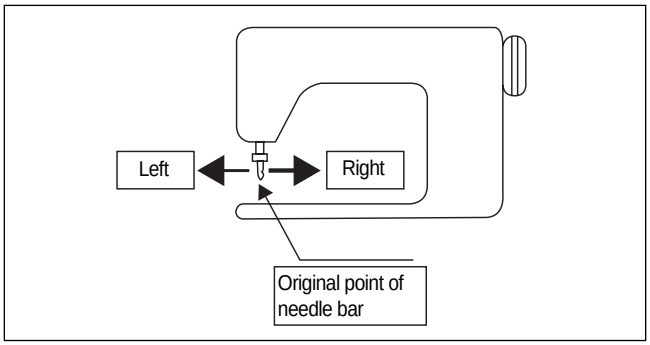
< Operation Method >

1. Turn on the power with pressing zigzag-width key and start condense key.
   - Indication device is displayed " tESt" and after a moment, returns to test function mode.
   - Indication device displays "t-01".
2. Select test mode number by + and - key.
   - Mode scope : 1~10
3. Set the selected number by pressing half-stitch key.
   - PARA/SET indication device blinks.
4. Set run/stop by straight-line pattern key.
   - Straight-line pattern lamp turns on.
   - PARA/SET indication lamp blinks continuously.
5. Pressing half-stitch key, return to selection mode.



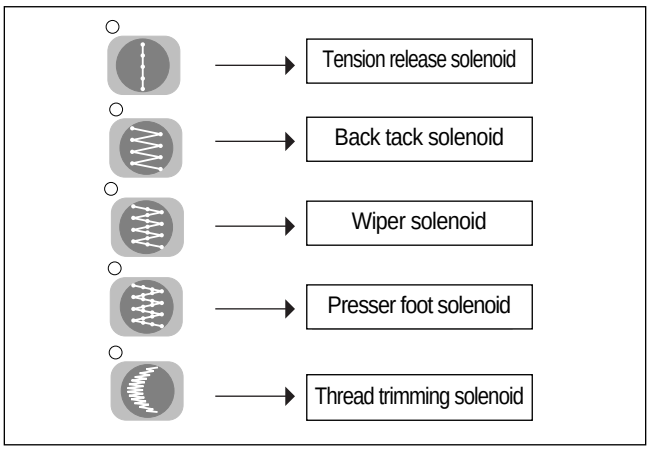
(1) XY jog & Original Sensor Test

1. After selecting test mode, make "t-01" to be displayed.
   - Set the mode by pressing half-stitch key.
2. Pressing + and - key, step motor rotates to the right and the reverse. (At this time, whenever needle bar passes the original point, indication lamp of straight-line pattern blinks or turn off.)
   - + key : Needle bar moves to the right. (lamp On)
   - - key : Needle bar moves to the left. (lamp Off)
3. End test by pressing half-stitch key.



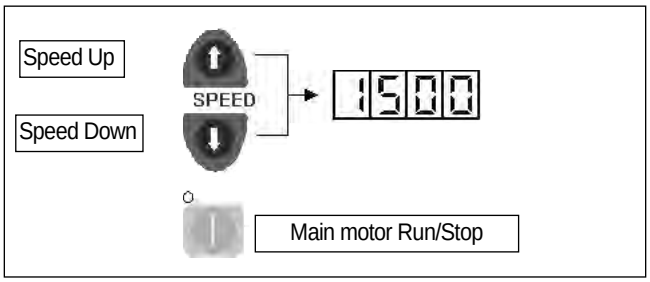
(2) Solenoid on/off test function

1. After selection test mode, make"t-02" to be displayed.
   - Set the mode by pressing half-stitch key.
2. Pressing the corresponding key as shown in the figure, solenoid acts and corresponding lamp turns on.
3. End test by pressing half-stitch key.



(3) Main motor test function

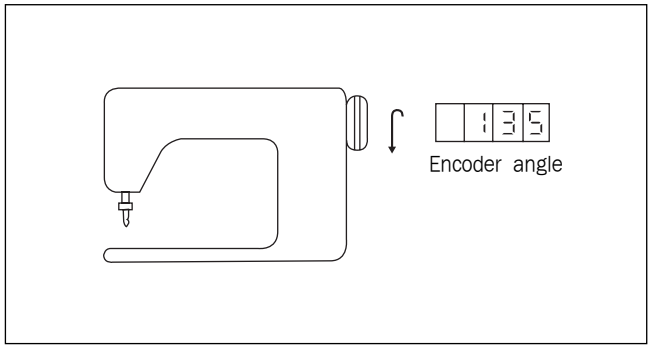
1. After selection test mode, make"t-03" to be displayed.
   - Set the mode by pressing half-stitch key.
2. Set speed by pressing speed increase/decrease.
3. Pressing straight-line pattern key, motor rotates.
4. Pressing straight-line pattern key again, it stop.
5. End test by pressing half-stitch key.



(4) Pulley Location (Encoder) Test Function

1. After selection test mode, make"t-04" to be displayed.
   · Set the mode by pressing half-stitch key.
2. Turning by hands as shown in the figure, encoder angle is displayed on the indication device.
3. End test by pressing half-stitch key.

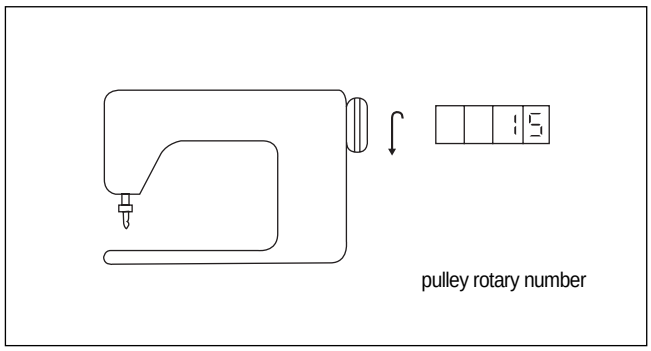
<Note>
If value does not change, encoder system including connector is in trouble.



(5) Synchro Test Function

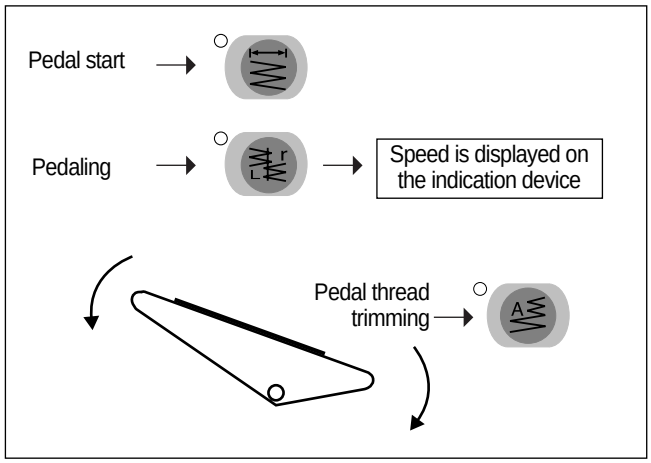
1. After selection test mode, make"t-05" to be displayed.
   · Set the mode by pressing half-stitch key.
2. Turning by hands as shown in the figure, number of pulley rotation is displayed on the indication device.
3. End test by pressing half-stitch key.

<Note>
If value does no change despite turning more than 1 circulation, synchro system including connector is in trouble



(6) Pedal Input Test Function

1. After selection test mode, make"t-06" to be displayed.
   · Set the mode by pressing half-stitch key.
2. Starting pedaling forward as shown in the figure, width indication lamp turns off and stepping, base line indication lamp turns off. And stepping backward the pedal, indication lamp of start condense turns off.
3. End test by pressing half-stitch key.



(7) Aux out Test Function

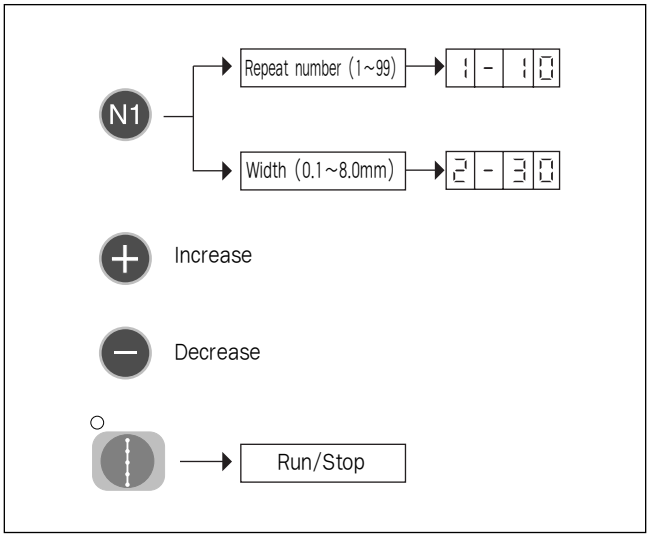
1. After selection test mode, make"t-07" to be displayed.
   · Set the mode by pressing half-stitch key.
2. Pressing straight-line pattern key, all the 8 auxiliary output (J11 on digital board) turn on and pressing straight-line pattern key again, all turn off.
3. End test by pressing half-stitch key.

(8) Aux In Test Function

1. After selection test mode, make"t-08" to be displayed.
   · Set the mode by pressing half-stitch key.
2. Pressing knee-lifter key, indication lamp of end condense turns on or turn off, and pressing reverse switch(A button), lamp of needle down stop turns on or turns off.
3. End test by pressing half-stitch key.

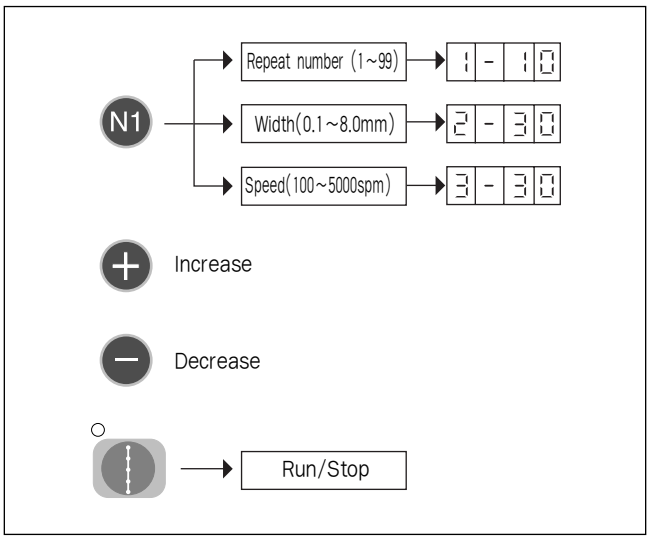
(9) X direction stepping motor motion Test(1)
---> jumping test

1. After selection test mode, make"t-09 to be displayed.
   · Set the mode by pressing half-stitch key.
2. Set repeat number and width by pressing N1 key as shown in the figure.
   · Repeat number : 1~99 times (ex : 10 times)
   · Width : 0.1~8.0 mm (ex : 3.0 mm)
3. Pressing straight-line pattern key, it operates.
4. End test by pressing half-stitch key.



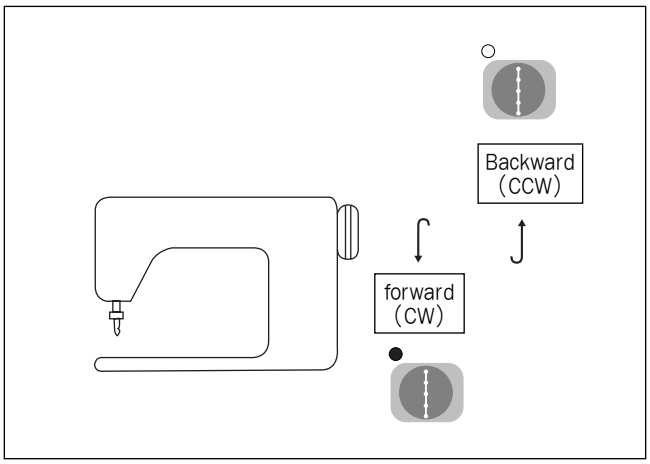
(10) X direction stepping motor motion Test(2)
--> moving test

1. After selection test mode, make"t-10 to be displayed.
   · Set the mode by pressing half-stitch key.
2. Set repeat number and width by pressing N1 key as shown in the figure.
   · Repeat number : 1~99 times (ex : 10 times)
   · Width : 0.1~ 8.0 mm (ex : 3.0 mm)
   · Speed : 100~5000 spm (ex : 3000 spm)
3. Pressing straight-line pattern key, it operates.
4. End test by pressing half-stitch key.



(11) Speed Test Function

1. After selection test mode, make"t-11 to be displayed.
   · Set the mode by pressing half-stitch key.
2. Turning pulley by hands forward as shown in the figure, straight-line indication lamp turn on , and backward, straight-line indication lamp turn off.
3. End test by pressing half-stitch key.



5) Parameter Changing Method and Classification

(1) General Sewing related Parameter Number (A Group)

※ Operate by pressing N1 key after turning on the power pressing PARA/SET key. Select desired number, press straight-line pattern key and change parameter value. Then, store the changed value by pressing straight-line pattern key again.

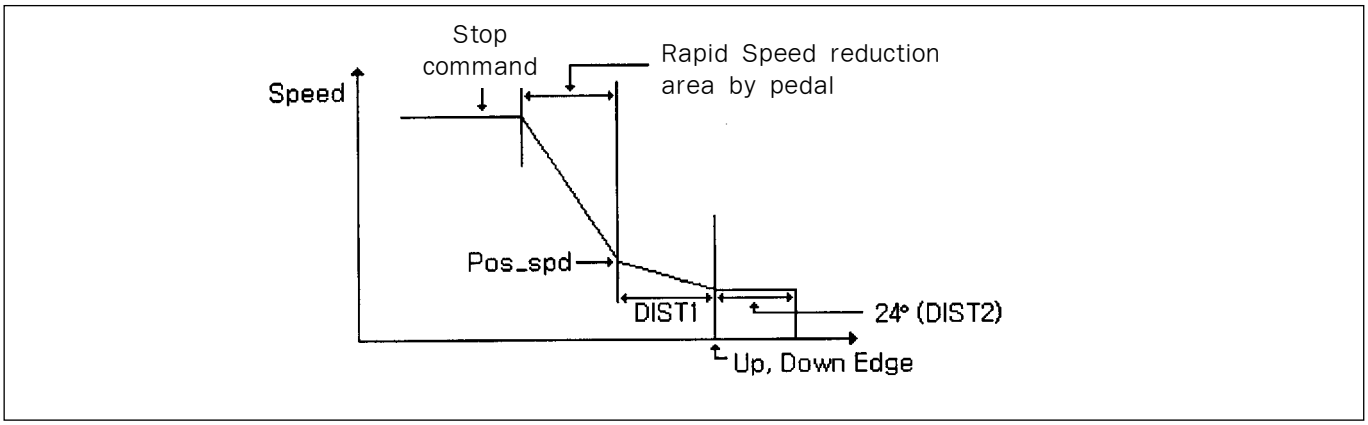
No.	Function and Description	Setting Scope	Shipping Status	Unit
A-01	Maximum sewing speed	5000 spm	4000 spm	100smp
A-02	Set speed of sewing start 1～5 (soft start setting)	[1]Stitch : 200～900 [2]Stitch : 200～2700 [3]Stitch : 200～2700 [4]Stitch : 200～2700 [5]Stitch : 200～2700	200 spm 500 spm 1000 spm 1500 spm 2000 spm	100smp
A-03	Set whether to use automatic knee lifter	0 : Impossible 1 : Possible	0: impossible	
A-04	Speed of half-stitch	100～510spm	100 spm	2spm
A-05	Set operation key lock function	0 : Impossible 1 : Possible	0: impossible	
A-06	Set maximum zigzag-width	0.1～10.0mm	8.0mm	0.1mm
A-07	Not use			
A-08	Not use			
A-09	Not use			
A-10	Set XY feed start location	0～255	0	1
A-11	Set thread trimming speed	100～510spm	190 spm	2spm
A-12	Set reverse rotation after thread trimming	0 : Impossible 1 : Possible	0: impossible	
A-13	Set reverse rotation angle after thread trimming	0～255°	24°	1°
A-14	Delay time after thread trimming	4～1020ms	4ms	4ms
A-15	Wiper On time	4～1020ms	40ms	4ms
A-16	Wiper Off time	4～1020ms	40ms	4ms
A-17	Time taking to automatically rise presser foot	1～30S	30s	1s
A-18	Presser foot rise time	4～1020ms	4ms	4ms
A-19	Presser foot fall time	4～1020ms	200ms	4ms
A-20	Tension release solenoid Full On time	4～1020ms	500ms	4ms
A-21	Back tack solenoid Full On time	4～1020ms	64ms	4ms
A-22	Wiper solenoid Full On time	4～1020ms	500ms	4ms
A-23	Presser foot solenoid Full On time	4～1020ms	100ms	4ms
A-24	Thread trimming solenoid Full On time	4～1020ms	500ms	4ms
A-25	Tension release solenoid duty	20～70%	50%	5%
A-26	Back tack solenoid duty	20～70%	15%	5%
A-27	Wiper solenoid duty	20～70%	50%	5%
A-28	Presser foot solenoid duty	20～70%	50%	5%
A-29	Thread trimming solenoid duty	20～70%	50%	5%

(2) Servo Motor related Parameter Number (B Group)

※ Operate by pressing N2 key after turning on the power pressing PARA/SET key. Select desired number, press straight-line pattern key and change parameter value. Then, store the changed value by pressing straight-line pattern key again.

No.	Function and Description	Function Name	Setting Scope	Shipping Status	Unit,Remarks
B-01	Location detecting speed to stop	pos-spd	2～510spt	220spt	2spt
B-02	Speed just before stop	end spd2	0～255spt	16spt	1spt
B-03	Delay time to be at right location at stopping moment	StopDelay	4～1020ms	80ms	4ms
B-4	1 location detecting distance	DIST1	0～255	150Pluse	1Pulse
B-05	Distance gain A	KC1A	0～255	10	1
B-06	Distance gain B	KC1B	0～255	2	1
B-07	Distance gain C	KC1C	0～255	10	1
B-08	Entire level for distance gain	KC2	0～255	100	1
B-09	Speed gain A	KF1A	0～255	160	1
B-10	Speed gain B	KF1B	0～255	80	1
B-11	Speed gain C	KF1C	0～255	180	1
B-12	Entire level for speed gain	KF2	10～100	100	1
B-13	Strength at pulley stop	KH1	10～100	40	1
B-14	Recovered distance at pulley stop	KH2	2～100	20	1
B-15	Speed reduction rate from stop signal to location detecting speed	accelA	10～100	54	1
B-16	Speed increase rate (the bigger the faster)	accelB	10～100	80	1
B-17	Speed decrease rate (the bigger the slower)	accelC	2～100	30	1
B-18	Decrease ratio from location detecting speed to stop	accelD	0～255	4	1
B-19	Inertia value of sewing machine	Inertia	0～9960smp		Using inertia tuning
B-20		SPMUPPER		1000spm	40ms
B-21		UPPosition			No use
B-22		IND-REFM			No use
B-23		TRStartM			No use
B-24		TREndM			No use
B-25	Pulley size of sewing machine	PULUY-SIZEM			No use
B-26		CutStatM			No use
B-27		CutEndM			No use
B-28	Synchro sensor detecting time	SLockTmM	0.5～127.5sec	4sec	0.5sec
B-29	Overload detecting time	OvLoadM	0.5～127.5sec	3sec	0.5sec
B-30	Possible/impossible of sewing machine pulley fixing	HOLD-FG	1: possible 0: impossible	0: Impossible	
B-31	Servo motor rotating direction	HOLD-MODE	0: Reverse direction 1: right direction	1: right direction	
B-32	Original point detecting time	Orgtm	4～1020ms	500ms	4ms

※ Description of Shade part



- ■ B-04 (DIST1) : It is the value indication location that rapid speed reduction is completed at stop and though stable rapid speed reduction is available as much as the value is bigger, but final stop section gets long.
- ■ B-08 (KC2) : It can acquire by inertia tuning and if the value gets bigger, pursuit for speed gets slow. (Common user or/and technician's use is prohibited.)
- ■ B-12 (KF2) : It can acquire by inertia tuning and if the value gets bigger, pursuit for speed gets slow. (Common user or/and technician's use is prohibited.)
- ■ B-15 (accelA) : It can acquire by inertia tuning and as the reduced speed until completion of rapid speed reduction after input pedal stop signal, if the value is bigger, rapid speed reduction is made but if it gets too big, it may not be done.
- ■ B-16 (accelB) : In case of speed increase by pedaling, it is the value indication how fast speed increase and as this value is bigger, speed increase get faster to the objective speed but speed change can be large at the moment of reaching to objective speed.
- ■ B-17 (accelC) : As the value indication how fast speed increases in case of speed decrease by pedaling, as this value is bigger, speed decrease gets faster to the objective speed, but speed change can be large at the moment of reaching to objective speed.

※ Example that can use above function of shade part

① Rapid stop is not done and one stitch goes further
- In this case occurs when sewing machine is operated at high speed, or in case that rapid speed reduction is not possible within short time as load of sewing machine is big.
  Make value B-15 and B-17 large.

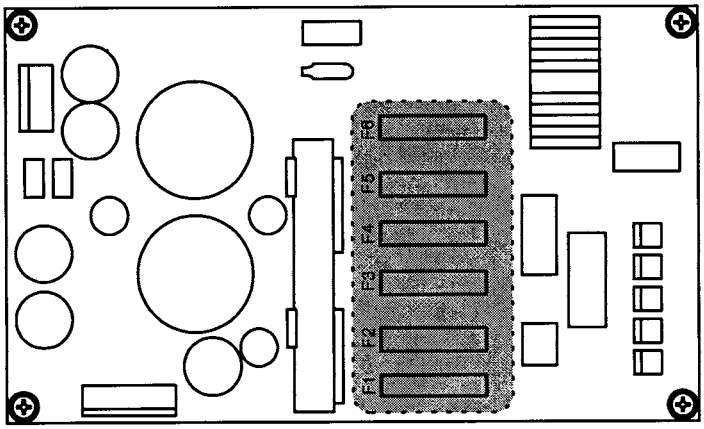
② When increase or decrease sewing machine speed, in slow case of the time that motor follows the speed
- This case can occur when increase or decrease rate is small comparing to increase/decrease load of sewing machine.
  Make value B-16 and B-17 large.

6) Exchanging the fuse

Danger	· To prevent from electric shade, turn off the power and wait 5 minutes, then open the cover. · Be sure to turn off power and exchange into the fuse of the designated quantity after opening the cover of control box.

(1) Power board

· connection part of fure for shade part (total 6)



· Fuses are used

No.	Quantity	Use
F6	5A	For the protection of main power
F5	7A	For the protection of solenoid
F4	0.5A	For the protection of air valve
F3	0.5A	For the protection of cooling fan
F2	0.5A	For the protection of step motor
F1	5A	For the protection of step motor driving board control power

(2) Main motor driving board

15A : For the protection of main motor driving board power.

(3) Step motor driving board

8A : For the protection of step motor driving board.

6 Block Wiring Diagram